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THE STATUS OF THE HEALTH CARE CAPABILITY  
OF ATHLETIC PROGRAMS IN MICHIGAN  
SENIOR HIGH SCHOOLS

By

Richard Wayne Redfearn

A DISSERTATION

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## ABSTRACT

### THE STATUS OF THE HEALTH CARE CAPABILITY OF ATHLETIC PROGRAMS IN MICHIGAN SENIOR HIGH SCHOOLS

By

Richard Wayne Redfearn

The survey of the health care capabilities of the athletic programs in Michigan senior high schools was intended to identify the practices of athletic medicine presently found in interscholastic athletic programs. The survey was the initial vehicle of discovery, which provided a comprehensive view of six basic areas of good safety and administration of the high school athlete and the general program that supported organized sports.

The need for the survey was readily evident. There is no single document available that relates the medical aspect of interscholastic sports in the state of Michigan. There are several empirical studies of individual high schools or community institutional plans, but no publication that provides a comprehensive view of the statewide program.

The survey was accomplished with the assistance of the Michigan High School Athletic Association and the Michigan High School Coaches Association. The schools selected for the survey were randomly selected from the

709 high schools that form the high school athletic association. Seventy schools were selected from each of four classes, and the principals of these schools were the respondents. Of the 280 questionnaires mailed in September, 1973, 216 were returned, for a statewide percentage of 77.15 percent. The distribution of return, by class, was nearly even.

Respondents were asked fifty questions. Two of these were open ended, and solicited the respondents' opinions about rules changes for the safety of high school sports, football in particular.

The six categories that received attention were: (1) physical medicine (and the practice of same), (2) athletic training, (3) athletic equipment and surfaces, (4) athletic medical education, (5) records of athletic trauma and rehabilitation, and (6) athletic medical-legal aspects.

The survey attempted to identify practices that can be evaluated by both medical education and physical education. Once areas of need can be determined, then the educational components of the state universities can act appropriately to alleviate the situation. In this regard the results of the study provide a basis for advocating service and education for the high school community as well as additional research.

To my wife Deborah, who maintained love and  
warmth in the home and faith in our future.

## ACKNOWLEDGMENTS

To Dr. Louis C. Stamatakos, my gratitude for his trust and confidence in my competence to successfully negotiate graduate study in higher education. His respected role of teacher and trusted advisor has always been a source of strength during my quest for the doctorate in education.

To Philip E. Greenman, D.O., my appreciation for his continuing support of my research in athletic medicine. Without the unfailing moral and professional assistance of Dr. Greenman, this research may never have reached the pioneer stage of medical education it presently possesses.

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## CHAPTER I

### INTRODUCTION

The present investigation was designed to focus upon the health care delivery systems presently employed by the senior high schools in the state of Michigan. More specifically, the health care continuum was isolated as it pertains to the male and female athletes who compete on an interscholastic level.

The necessity for the study arose from the recognized inability of those in medical education to identify accurately, from any publication or study, the present practices employed by high schools in the medical care categories of physical evaluation, psychological evaluation, physical training, emergency medical techniques, medical care education of faculty teaching or coaching a sport, proximity of valid medical assistance, physical rehabilitation, and reevaluation of the injured athlete.

Until these practices can be determined by people who intend to dedicate their research capability to the betterment of athletic safety and physical competition, the foundation for such an undertaking is nonexistent.

### Background

The initial discussion of the subject of athletic medicine between the investigator and Philip E. Greenman, Doctor of Osteopathic Medicine and Chairman of the Department of Biomechanics at Michigan State University, took place in the fall of 1972. The investigator had developed an interest in the medical education and research intentions of the MSU College of Osteopathic Medicine, particularly how the College would regard the topic of athletic medicine. The resources of a college of medicine, the ability to marshall educational programs in the physical sciences, and the generally recognized need of better health care for athletes became the foundation of thought that led to the perception that research on the subject of athletic medicine is merited.

The Department of Biomechanics had been charged by the College of Osteopathic Medicine to research the application of osteopathic principles in the musculoskeletal system of the human body. Greenman stated he had a definite interest in the field of athletic medicine, but because of the newness of the College (founded in 1971) he had not yet found the expertise in faculty or the finances to research any phase of medical care and the application of osteopathy as it relates to the athlete.<sup>1</sup> However, he did state that

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<sup>1</sup>Philip E. Greenman, in conversation, September, 1972.



any empirical research that identified areas in which an athletic medicine effort would be of significant benefit would become a focal point for future discussions.

It seemed appropriate that the two disciplines, medicine and education, should merge into a positive effort to produce the necessary support required to promote the furtherance of athletic medicine. The initial step was to poll the potentially interested academic community at the university regarding their possible contributions to a program of athletic medicine.

A unique situation exists on the campus at Michigan State University. There are two colleges of medicine, and a large intramural and intercollegiate athletic program is supported by the university. Since both medical colleges have only recently been established, neither has become involved in providing particularized medical assistance to the athletic program.

A general survey of the interest in athletic medicine was solicited from individual faculty members of the various areas germane to athletic medicine. Ideas and observations were gleaned from faculty members in physical education (Gale E. Mikles), human medicine (James S. Feurig), osteopathic medicine (Larry L. Bunnell), nutrition (Olaf Mickelsen), exercise physiology (Wayne D. Van Huss), biomechanical engineering (Robert W. Little), and biochemistry (David G. McConnell). The result of the appraisal was

encouraging. It seemed that the willingness to embark on a scientific undertaking, ultimately benefiting the athlete, was readily available. Individually, each person was inclined to envision himself in a positive contributory role.

In further discussions with Dr. Greenman of the College of Osteopathic Medicine, the prospects of college community involvement with the amateur and interscholastic athlete were considered. The concept of family practice usually encompasses the responsibility of being the team physician for the local high school athletes and those who compete on the amateur level. The family practitioner witnesses trauma generated by physical insult during athletic competition. Thus it was decided an evaluation of the health care capabilities of athletic programs in the senior high schools in Michigan would identify the need for athletic medicine educational programs to be placed in future medical and educational curriculums. Should the research present evidence of a need and a viable educational model be designed to contend with the expected situation, then an academic and research function in the Department of Biomechanics would address itself to athletic medicine. However, the primary concern of this study was to gain research evidence about and identify medical needs of the high school athletic programs.

### Purpose of Athletic Medicine

Athletic medicine is the application of science to the understanding of the influence of athletic participation upon the human organism.<sup>2</sup> The effects of cybernation and leisure have necessitated self-regulated activity to occupy time not involved in work or to avoid the undesirable effects of sedentary life. In a nation of 220 million people, there is no accurate estimation of what percentage of the population engaged in physical activity.

Although the professional athlete receives expert medical advice and care related to his particular sport, the average part-time or amateur athlete receives little guidance from the medical profession that informs him about the potential benefits or hazards of his engaging in athletic participation. It is estimated that seventeen million Americans are injured in recreational sports each year.<sup>3</sup> Thus it seems appropriate to attempt to identify the procedures, habitual settings, or beliefs that contribute to the injury of the athlete.

The commonly accepted image of "the athlete" is that individual who, while in his youth or early adult years, participates in organized athletic competition in secondary

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<sup>2</sup>The American College of Sports Medicine, The Encyclopedia of Sports Science and Medicine (New York: McMillan & Company, 1971), preface.

<sup>3</sup>James A. Nicholas, "Spreading Sports Medicine Around," Medical World News 14 (April 1973): 7.

school, college, professional, or selective amateur ranks. All these participants are readily identifiable, but the total census of athletes is swelled by the extrinsic accountability of the people who qualify for athletic status by performing in solo or group sports in sporting clubs, Young Men's/Women's Christian Associations (or YM/WHA), or independently participate in swimming, boxing, wrestling, self-defense, jogging, track and field events, bowling, walking societies, or exercise by some form of physical endeavor.

In the current study the question then became: "How do we relate the practice of medicine to the human form that is in athletic participation?" The generally accepted philosophy was, whatever trauma presented itself to the physician could in turn be acted upon with approximately the same procedure for both the athlete and the nonathlete.<sup>4</sup> This manner of practice was acceptable until the tally of injuries from athletic competition and the ledger of nonathletic-oriented injury began to take on differing aspects of treatment to accommodate variances in the same traumatized anatomical member.

In the three decades since World War II, medical education has seen the practice of general medicine evolve into the practice of specialty medicine. The education of

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<sup>4</sup>L. L. Bunnell, Director, Ingham County Hospital Family Care Clinic, Lansing, Michigan, in conference on Family Health Care Delivery, February, 1974.

physicians today is programmed with the thought in mind that the student will be predisposed to a concentrated area of medical study. With the expansion of medical knowledge it has been difficult to envision any physician with the intellectual capabilities sufficient to retain the various functions and practices of physical medicine currently available in the higher levels of medical education. Consequently, expertise is demonstrated in every imaginable specialty of physical medicine.

The orthopaedics specialty traditionally has been clinically involved with the trauma associated with the skeletal system of the human body. Because of this association, the orthopaedic physician has historically been the first source of reference for the athlete. The preponderance of data on athletic injury has habitually dealt with the skeletal structure of the human body.

The evolution of the many sports embraced by American society has led to excellence of performance that was thought to be nearly impossible a number of years ago. The product of this achievement is the athlete who has turned his every effort into a quest for a championship performance in a singular sport. The professional and collegiate ranks are illustrations of this effort. The athlete has evolved in much the same manner as the physician; both could be specialists in their own field. The subject matter for physicians has grown at such a rapid rate that adequate comprehension

of the total medical spectrum is impossible to expect of any individual. The same is true for the athlete. Time and effort have been allotted to a specific program that has so occupied the athlete that little time remains to engage in other athletic programs. Consequently, the skills, motivations, and energies exhibited by the athlete have been channeled into a specialty. To add to this corollary, one may compare the selective study necessary for the physician to become a specialist in orthopaedics to the selective effort of the athlete to become a high-calibre performer. Both have narrowed their field of achievement. The dimension of the study and effort no longer encompasses the broad latitudes of subject or sport, but rather has embarked on a third dimension--depth.<sup>5</sup> They both choose to excel in one segment of the total spectrum of either medicine or the sport. In both cases, the ability to devote time, energy, knowledge, and skill to their respective endeavors will increase their achievement in their selected specialties.

The intent of this discussion has been to illustrate the present directions of athletic training and medical education. Each undertaking has called for emphasis in a selected subject, regimented by rigid limitations in the

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<sup>5</sup>H. Royer Collins, paper presented at the Tenth Annual Post-Graduate Conference on the Medical Aspect of Sports, University of Rhode Island, Kingston, July 27, 1973.

application of educational materials to that subject. In retrospect, it seems there has been a narrowing of the educational process to achieve an accurate focus on some knowledge that represents the ultimate specialization.

Athletic medicine, represented in the orthopaedics specialty, has witnessed the necessity for specialization of study on a subject. However, there is a hesitancy to state that the orthopaedic specialty applies, universally, to the care of the injured athlete. Moreover, in these days of care a priori, the orthopaedist is ruled out of the primary care of athletes because he lacks complete medical knowledge of the athlete. This represents an acknowledgment by the medical profession that the athlete presents a problematic case that must be satisfied by many areas of medicine. The necessity of additional data concerning the athlete must be recognized. Biomechanics, hematology, nutrition, rehabilitation physiology, and radiology have all gained importance in the care of the athlete.<sup>6</sup> All are represented by specialties in the medical profession. Each occupies a position equal to that of orthopaedics when it was acknowledged as being the specialty associated with athletic medicine.

Likewise, the athlete who is portrayed in a single event needs to include other sciences and techniques in his

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<sup>6</sup>James S. Feurig, in conversation, Athletic Medicine Clinic, Michigan State University, September, 1973.

program to complement more fully his desire to become a superlative athletic performer.<sup>7</sup> Training techniques have gone beyond the parameters of how the refinements of the event should be negotiated. The practical aspects of a sport, such as what kind of competition an athlete should be placed against and the type of surface the event should be played on, are satisfied by the knowledge and experience of the coach. The sciences offer their expertise to the athlete also. The cardiology limitations of training become a consideration.<sup>8</sup> Proper diet information is available through the food scientist.<sup>9</sup> Weight limitations are recommended by the exercise physiologist.<sup>10</sup> The monitoring of vital organ function under both physical stress and basal states is accomplished by the biochemist and the pharmacologist.<sup>11</sup> These are major considerations for the athlete and are important to acknowledge, as they all have a significant function in his performance.

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<sup>7</sup>Robert Castleman, Varsity Track Letterman, Michigan State University Big Ten and NCAA Champion in intermediate distances, 1973 and 1974, in discussion, April, 1974.

<sup>8</sup>Richard Lampman, Director, Cardiac Evaluation Clinic, University Hospital, Ann Arbor, in clinic, May, 1974.

<sup>9</sup>Olaf Micklesen, Professor, Food Sciences, Michigan State University, in discussion, December, 1972.

<sup>10</sup>Wayne VanHuss, Professor, Department of Health, Physical Education and Recreation, Michigan State University, in discussion, January, 1974.

<sup>11</sup>James G. Garrick, Director, Division of Sports Medicine, University of Washington, in discussion of sports medicine at Michigan State University, March, 1974.



Both the athlete and the physician have followed similar pathways to achieve excellence in their respective specialties. In so doing, they cannot adequately function outside their immediate fields of endeavor without involvement with other specialties. The physician who is inclined to direct his medical aspirations to the field of medical care for athletes is faced with the fact that a single medical specialty, usually orthopaedics, will not suffice if the intention is to render comprehensive care.

It would appear that the medical practitioner has been confronted with an evolution of medical desirability that has come full circle. Medical practice for athletes has witnessed first the general practitioner, then the specialist, and recently the concept that a broad-spectrum medical practice is necessary for the care of athletes.<sup>12</sup> However, the fact that broad-spectrum medicine is now in vogue does not indicate that the general practitioner of several decades ago will be returned to his position of importance. On the contrary, the new general practitioner will, of necessity, have to display a firm grasp on the medical knowledge that is represented in the aforementioned medical specialties. The depth of knowledge will not be as demanding as any one of the specialties, but a fundamental expertise will be paramount for proper care of the athletic community.

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<sup>12</sup>Ibid.

A major concern of the present study was that once the area of health care for athletes reached a plateau of organized athletics below the collegiate or professional level, the ability to accommodate specialization would be missing. A small number of athletes have access to good medical care, while the greatest number, represented by the youth of the nation, have access to little or no medical care.<sup>13</sup>

The situations regarding the specialized physician and the specialized athlete should serve to illuminate the philosophical position each endeavor now holds. The guidance of both pursuits has been omnidirectional as a result of a certain unidentifiable lack of educational surveillance. For three decades the explosive nature of medical education, resulting from a vast research capability, has grown tangentially from the core of medicine, which was once known as general medicine. Instead of monitoring the growth of medicine in a proportional sphere, the medical profession has allowed medicine to assume a design in which the specialties are appendages of the shrinking core, which represents the aforementioned general medicine.

The same analogy applies to the athlete. Time and specialization have transformed the athlete into a specific sports representative. The word athlete historically has indicated competition in sports, games, or exercises. The

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<sup>13</sup>Nicholas, "Spreading Sports Medicine," p. 8.

present-day athlete seldom participates in more than one sport, game, or exercise. In fact many sports are divided into several contributory events that collectively are called a sport--i.e., track and field, where the running events alone entail distances of 220 yards, 440 yards, 880 yards, the mile, two miles, and so forth on up to the marathon distance. An athlete seldom can participate in all or even the majority of these events. The athlete who is subclassified as a track man (or woman) is not expected to have the requisite skills and stamina to accurately be called a track man. The term then becomes a generality; specifically, a person is a miler, a dash man, and so on. Thus specialization has called for exactness when speaking of an "athlete."

The specialized athlete can call upon the talents of other specialists in the physical education fields. Likewise, the medical specialist can request assistance from other specialists to supplement his needs as the cases arise. All of this makes one wonder how athletic safety will survive and how medical protection can be given to the vast majority of our athletic population by the specialty or general medical profession.

Figure 1 depicts a concept of the availability of medical care for several levels of athletic competition and how they relate to the envisioned adequacy of medical health care. In this presentation the medical capability represents

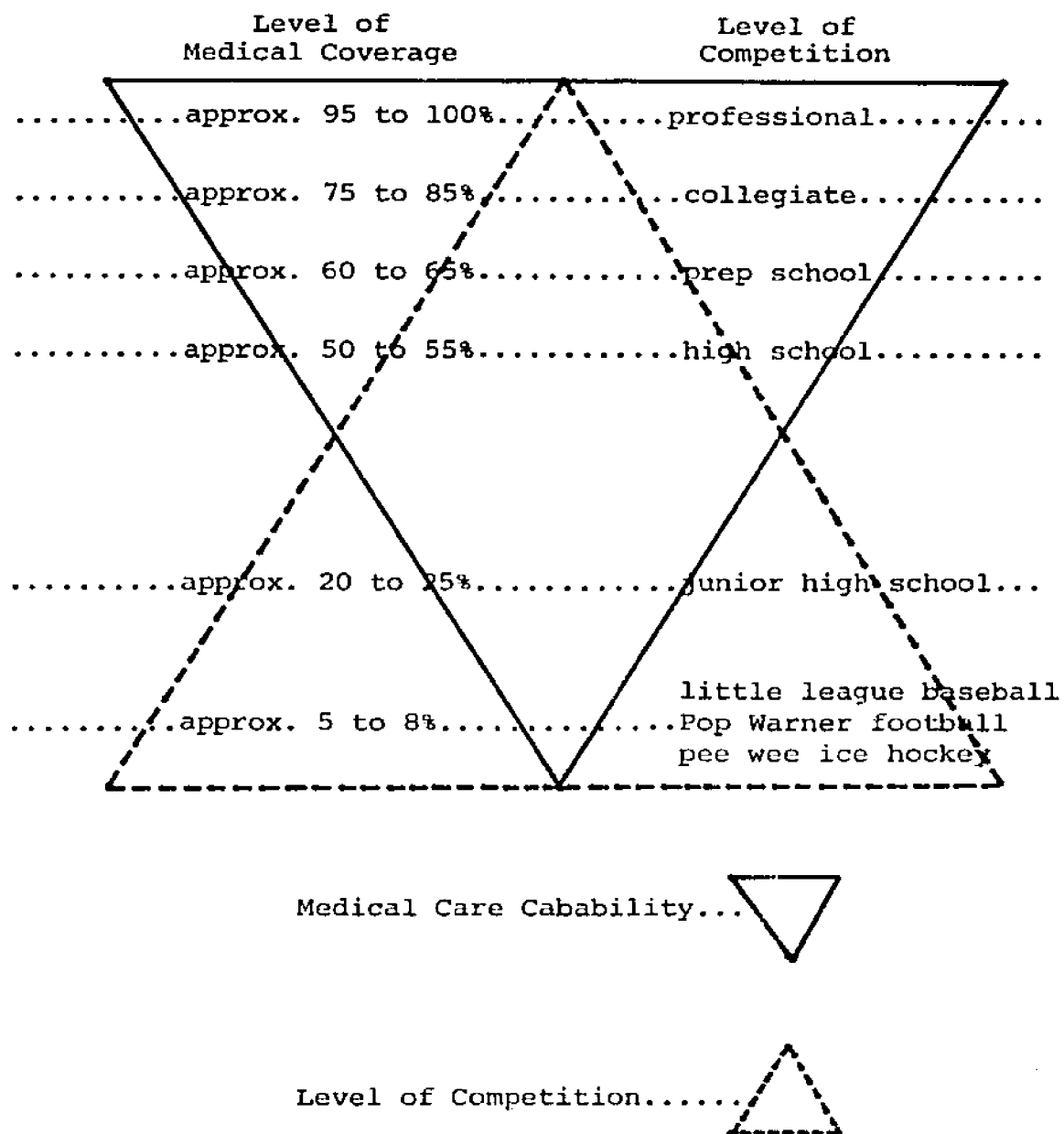


Figure 1.--Hypothesized medical care for various levels of athletic competition.

the medical profession in general. The inverse proportions are illustrative of the concern of health care delivery systems as they presently exist in the state of Michigan.

In summary, several salient thoughts manifest themselves throughout this introduction to athletic medicine and the problem areas of the topic. The first negative aspect is that the trend of medical education may significantly refrain from teaching the collective skills necessary for treating athletes. The financial structure in which specialization has placed itself is a singularly restricting concern for the consumer. If athletes could be treated by one specialist, then the money problems might reasonably be satisfied. However, when several specialists are involved in a case the costs become astronomical and totally unrealistic. Second, there is an evidenced lack of appropriate education for physicians.<sup>14</sup> The annual attendance at seminars and symposiums on sports medicine witnesses a growing number of physicians who regard the athlete in a different category of patient than the usual traumatized patient.<sup>15</sup> Third, there will be a continuing

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<sup>14</sup>James A. Nicholas, "The House That Nicholas Built," The Physician and Sportsmedicine 1 (November 1973): 73.

<sup>15</sup>A. A. Savastano, Opening remarks at the Tenth Annual Post-Graduate Conference on the Medical Aspect of Sports, The University of Rhode Island, Kingston, July 26, 1973.

disproportionate distribution of physicians if the medical student is schooled in the merits of specialty medicine vice general medicine.<sup>16</sup> Specialists inherently are found in great numbers around population centers and university structures. This is not at all encouraging to the population in need of medical services who live in other areas of the state. Such maldistribution will create additional anxiety in the rural and sparsely populated areas of the state, where people have been treated by general practitioners throughout their lives, but now see them either moving away or dying and not being replaced. Finally, the ignorance of physicians about athletic medicine will necessitate additional education for the profession on a post-graduate level. The problem also calls for emphasis on the expansion of the physical education curriculum to embrace the professions of athletic trainer, physical therapist, clinical nurse, scientifically oriented physical educators, and others of the associate professional medical fields. This expansion, in some ways, will lighten the demand upon the physician. Several organizations are pressing the Michigan legislature for licensure rights to practice as certified athletic trainers.<sup>17</sup> The most potent of these

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<sup>16</sup>John A. Doherty, Executive Director, Michigan Health Council, East Lansing, Michigan, in discussion, September, 1972.

<sup>17</sup>George Andrews, Certified Athletic Trainer and Member, Great Lakes Athletic Trainers Association, in discussion, March, 1974.

factions is the National Athletic Trainers Association, represented by the Great Lakes Athletic Trainers Association. This group is a professional athletic trainers organization, dedicated to the advancement of physical safety in athletics.

The practice of medicine has gravitated away from the general practice field that at one time carried the major portion of the responsibility for care of high school athletes. The overview of the medical situation, while growing more sophisticated in a medical-technical sense, has illustrated a fear that the medical care for high school athletes has deteriorated significantly. Within the last several decades there has been a polarization in medicine. Medical education research does not have any reliable estimates of how this evolution in medicine has affected the athletic population of the high schools in Michigan. Such base data have to be realized before any firm commitment to athletic medicine can be made in the College of Osteopathic Medicine at Michigan State University.

#### Need for the Study

It was envisioned that the logical population from which to draw data would be the one with the largest numbers of people in athletic participation. Referring to Figure 1, the observer would possibly start at the little league level. However, little league and the junior high school level of athletic participation would require contacting teams

throughout the state. Little league does not have a state-wide organization that exhibits administrative continuity in all the areas of the state that would be needed for proper representation. The junior high school programs are very well organized in high-density population areas, but are virtually nonexistent in the lesser populated areas of Michigan.

The next alternative, then, was the high school level and it is quite possibly the segment of organized athletics that needs to be studied because of the lack of medical data on the high school athlete. The high schools in Michigan also present an organized format from which data can be drawn. A realistic concept for a research effort would be a survey of the actual health care capability sequences that follow the interscholastic athlete. A study that would solicit factual information from a reliable source was suggested by Dr. P. E. Greenman, Chairman of the Department of Biomechanics at Michigan State University. It was felt by the investigator and Dr. Greenman that the main thrust of any athletic medicine research emanating from a state-supported institution would be the collection of data intended for the design of educational models that, in turn, might significantly alter the health care policies as they presently exist in Michigan high schools. This collection of base line data and general evaluation of athletic medical provisions and services in Michigan high



schools was intended to provide basic information for the design discussed above. Because it was felt to be inappropriate, no comparison would be made between one school and another or one class of schools and others.

Concerned physicians, physical educators, and high school administrators have voiced a growing suspicion that existing health care practices in the high schools are falling far short of their intended goals.<sup>18</sup> Proper health care is not structured on a statewide basis. Rather, health care delivery is recommended by the Michigan High School Athletic Association, but is subject to interpretation and compliance at the local level. There is no state dictate pertaining to the medical care of an individual interscholastic athlete.<sup>19</sup> In 1927, the state of Michigan established the requirement for a preseason physical examination for interscholastic athletes.<sup>20</sup> This was landmark legislation in its day. The National Collegiate Athletic Association did not require preseason physicals for football players until 1933.<sup>21</sup>

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<sup>18</sup>Gale Mikles, Chairman, Department of Health, Physical Education and Recreation, Michigan State University, in conversation, September, 1973.

<sup>19</sup>Allen W. Bush, Director of Athletics, Michigan High School Athletic Association, Lansing, in conversation, September, 1973.

<sup>20</sup>Wesley W. Hall, Editorial, The Journal of Sports Medicine 1 (September 1972): 19.

<sup>21</sup>*Ibid.*

The lack of health care in the high school athletic setting is usually self-evident. For example, it can be witnessed in abnormal growth and physical development retardation.<sup>22</sup> Adams stated that in physical examinations of eighty high school wrestlers in Philadelphia, he found seventy-six of them to have an irregular growth pattern.<sup>23</sup> Lack of health care could also be witnessed by the announced rejection of the values of sportsmanship that were taught in youth.<sup>24</sup>

The youth in the high school setting place their trust in the administration for their well-being. Proper medical care, although ill defined at present, is what they expect to receive. However, few student athletes in secondary schools have the education or maturity to question the medical practices they observe annually in their own schools.

Ideally, athletic medical care embraces a broad spectrum of involvement with physiology, psychology, and physical medicine. Administering these categorical sciences becomes the keynote to the establishment and management of a

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<sup>22</sup>T. K. Tchong and C. M. Tipton, "Iowa Wrestling Study: Anthropometric Measurements and Prediction of a Minimal Body Weight for High School Wrestlers," Medical Science in Sports 5 (1973): 1-10.

<sup>23</sup>Joseph S. Torg, in seminar discussion at the Tenth Annual Post-Graduate Conference on the Medical Aspect of Sports, The University of Rhode Island, Kingston, July 27, 1973.

<sup>24</sup>Zdenek Hornof and Cestmir Napravnik, "Analysis of Various Accident Rate Factors in Ice Hockey," Medical Science in Sports 5 (1973): 283-286.

conscious effort to insure that the youth of our high schools receive the medical considerations their trust demands.

The philosophy of athletic medicine is expressed in the fundamental belief that athletes should have the best medical care that is appropriate for the sport in which they participate. To take this logic and apply it to the Michigan high school athlete was the initial step of the analysis. To evaluate Michigan high schools, documents and related published material were sought which would indicate the current position of medical care in secondary school athletic programs.

No identifiable document or collection of documents revealed and critiqued the health care capabilities that exist for the interscholastic athlete in Michigan high schools. In this context, the Michigan High School Athletic Association gave this study its support and cooperation. It was of paramount importance that a research instrument be constructed that would provide an adequate overview of the health care delivery systems for high school athletes. It was envisioned that the overview would include recommendations regarding inadequacies in the health care delivery systems and planning for their improvement.

#### Statement of the Problem

The primary problem examined in this study was the amount and kind of medical care Michigan high schools

provided while attending to the precautions necessary for safe physical participation in the interscholastic athletic programs. This care has historically been satisfied by an evaluation of the degree of medical and first-aid expertise engendered in the faculty and physical education staff. Proficiency has traditionally included knowledge of physical training techniques; level of education, specifically in the physical sciences of exercise physiology and kinesiology; and athletic psychology (athletic psychology being the latest to be applied to the athletic community by the behavioral scientist<sup>25</sup>). The ability of a physical educator or coach to recognize injury and adequately tend to that injury has been a questionable area of health care.<sup>26</sup> Concern for the athlete encompasses the rules of the contest, the equipment to be worn, the conditions of the playing surface, the adequacy of the officials to guarantee fair play, and the sequences of medical procedure in the case of injury or incapacitation while engaged in an athletic contest.

The high school has an obligation to make every effort to insure safety of the athlete. The problem is that there is no known measurement in use that could

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<sup>25</sup>B. C. Ogilvie and T. A. Tutko, Problem Athletes and How to Handle Them (London: Pelham Books, Ltd., 1965).

<sup>26</sup>Thomas D. Meek, "Football Injuries: Acute Subdural Hematoma Without Loss of Consciousness," Texas Medicine 66 (July 1970): 58-59.

accurately ascertain and evaluate the medical care considerations and the physical safety of the athlete in Michigan high schools.

### Setting of the Study

The setting of the study was the senior high schools in Michigan. This included high schools that counted four years (grades nine, ten, eleven, and twelve) as senior high school and those that declared the grades of ten, eleven, and twelve to be senior high school. The three-year senior high schools were customarily found in the class A and class B high schools. The four-year senior high schools were those of lower total enrollment, predominantly identified with the class C and class D high schools.

Total, full-time student enrollment is used to assign high schools to one of the four classes. For the sake of fair play, schools are required to participate in interscholastic athletics with teams that represent other high schools of similar size. Table 1.1 reveals the class distribution for the state of Michigan in the fall of 1973, as prescribed by the Michigan High School Athletic Association.

### Plans for the Study

Upon receipt of the information from the high schools, a grouping of the data was to be made by class of high school. The elicited information was not to be

utilized in a comparison fashion. It must be remembered that the goal of the research was to ascertain the capabilities of the high schools to deliver comprehensive medical care to the resident student-athlete population, not to grade one high school against another.

Table 1.1.--Distribution of high schools by class, as assigned by the Michigan High School Athletic Association.

Class	Enrollment Numbers	Total High Schools in Class
A	1361 or more students	181
B	651 to 1360 students	183
C	339 to 650 students	177
D	Fewer than 339 students	<u>168</u>
	State total	709

The adequacy review was to be conducted by using a cross-reference comprised of the sports medicine research, the opinions of the medical professionals vis-à-vis standards of health care in Michigan high schools, and the expertise of physical education faculty at both Michigan State University and The University of Michigan.

The information elicited would have a practical aspect as well. It was planned that appropriate data would be transmitted to several state agencies seeking referendum in the state legislature for rule changes. Legislative

leadership could then inaugurate mandatory compliance to acceptable medical and health care delivery systems for high school athletes.

The Michigan High School Athletic Association wanted the data for a critical analysis of the practices they administer in the state. The Association was aware that the health care for athletes in Michigan high schools, in some instances, was operating in a marginal to unsatisfactory fashion. However, the Association felt rather restricted because they knew of the severe financial constraints the high schools were experiencing.<sup>27</sup> It was presumed that the monies allocated for each athletic program have been employed to the maximum. Should an Association mandate regarding medical availability be thrust upon Michigan high schools, the ensuing financial burden may cause some interscholastic activities to be cancelled, because of insurmountable financial difficulties.

The information was also to be sent to the Michigan High School Coaches Association for review. A portion of the findings from the survey would be examined by that Association to estimate the potential for rule changes. The Coaches Association also desired information and opinions on injured player eligibility and a standardized

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<sup>27</sup> Allen W. Bush, Director of Athletics, Michigan High School Athletic Association, Lansing, in interview and discussion, September, 1973.

physical examination for the physically rehabilitated athlete. The fact that an athlete is considered physically fit for the day-to-day social and academic events of the school should not be misconstrued as medical clearance to return to the sport in which he was originally injured. Time spent in the healing process usually causes a degree of atrophy in the injured musculature. The return of a previously injured athlete to normal participation frequently presents several psychogenic components. The athlete may display the traits of emotion, discouragement, fatigue, or apathy, all of which make him more susceptible to reinjury than the uninjured athlete is to initial injury.<sup>28</sup>

The Michigan Health Council desired demographic data, which they could use to evaluate the availability of various medical professions in several areas of the state. Such data supplied to the Council were the numbers of physical therapists, nurses, medical facilities (and the relative distance from school to hospital), licensure of physician (allopathic or osteopathic), and the availability of emergency aid that was to be found in the community or the county that sponsored the high school.

The study, in toto, was also to be placed at the disposal of the National Athletic Trainers Association for use in a legislative effort to seek a standard licensure

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<sup>28</sup>D. Ryde, "The Role of the Physician in Sports Injury Prevention," The Journal of Sports Medicine 5 (1965): 152.



for certified (NATA) athletic trainers.<sup>29</sup> Action by the state legislature in Lansing on this licensure was pending at the time of this writing.<sup>30</sup>

It was expected that this survey would yield information that would become foundational research material for the design of a functional division of athletic medicine and research in the Department of Biomechanics at Michigan State University. A portion of the research in this division was to be conducted on the campus at Michigan State University, but the main thrust of the research was to be directed toward the senior high school athlete population in the state of Michigan.

#### Overview of the Study

In Chapter II the literature relevant to the topic of athletic medicine is reviewed. There is a paucity of research on the athletic medical programs and the application of those medical programs to the high school setting. The focal point for much of the subject is expressed in specific publications that address specialty fields of medicine.

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<sup>29</sup>Bobby Gunn, President, National Athletic Trainers Association, Indianapolis, Indiana, and Head Trainer for the Houston Oilers Football Team of the National Football League, personal correspondence, May, 1973.

<sup>30</sup>Donald Graham, President, Don Graham Associates, Licensed Physical Therapists, in discussion, April, 1974.

In Chapter III, the design of the study is explained. The demography of the study is accounted for, as is the method of selection of respondents. The operational procedures are explained, as well as the procedures used in identifying the data. Additionally, certain questions that need further investigation are discussed.

Chapter IV contains the research findings and the results of the analysis of the data.

Chapter V is a summary of the results and conclusions of the study, with discussion and the recommendations generated by the research.

## CHAPTER II

### REVIEW OF SIGNIFICANT LITERATURE

The nature of the study necessitated a general review of research pertinent to the practice of medicine in the realm of the secondary school athletic programs. The first section of this chapter is devoted to a presentation of representative writings on the subject of physical medicine and the examination of the potential high school athlete. The second section is intended to report the literature related to the field of athletic psychology. Writings on the growing segment of athletic medicine that concerns the woman athlete are presented in the third part of the chapter. Reviewed in the fourth section is the literature concerned with the safety of athletic equipment.

#### Literature Related to the Physical Examination of Athletes

You won't be surprised to know that an accurate history is by far the most important thing in discovering and evaluating disabilities; but getting a good history from an athlete is not easy. He may not unload symptoms like most patients in your practice. Chances are he is not sick or in pain, and you pose more of a threat than an asset to his career. Keep this in mind, because athletes have been known to distort, conceal or deny important items in their past history. More distressing, parents sometimes encourage or aid the evasions, and you may find a physician goes

along with it by omitting specific points in a carefully worded letter that evades responsibility if the boy does play.<sup>1</sup>

The preceding statement by Hirata draws attention to the fact that proper care of the high school athlete is the responsibility of the physician, the family of the athlete, and the school system that supports the athletic program in which the athlete participates. The statement also accurately portrays the basic reason for the paucity of personal medical histories, as reported in the current survey. The lack of knowledge of the personal health history has plagued the medical profession since health records became mandatory. It matters not what the findings have been on any given individual, if the recording of those findings has not been accurate and intelligible.

Weed recommended that each health history be a process of education to both the patient and the physician.<sup>2</sup> The patient's fear of exposure, to which Hirata alluded, could be alleviated by the methodology championed by Weed. Ignorance could be adequately contended with by teaching the patient that the medical record is both a diagnostic tool and a teaching instrument. The fundamental fear of most athletes is that they have some disability of which they are unaware, and that the physician will uncover some

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<sup>1</sup>Isao Hirata, Jr., "When to Exclude Athletic Competition," The Consultant, January, 1974, p. 79.

<sup>2</sup>Lawrence L. Weed, The Problem Oriented System (New York: Medcom, Inc., 1972), p. 23.

physical weakness or malformity. Much information about the athlete-patient can be ascertained by the family history. The recording of a family medical history is a basic function of virtually every medical practice. The information gleaned from knowledge of the family traits and habits contributes to an overall understanding of any individual in that family. The ethnic origin, nutritional preferences, religious beliefs, and a host of other characteristics become inferences and identities to certain types of pathology. Add to this the social and demographic considerations, and a competent physician has an excellent start on a data base.<sup>3</sup>

The findings of a physical examination of an athlete are the backbone of a medical record. This raises the question: What constitutes an adequate physical examination? Vandeweghe stated that there is no minimum physical examination.<sup>4</sup> The necessary ingredient of a satisfactory physical examination, he said, are a complete medical history, including a list of past injuries and the sports in which the athlete competes, and an undressed examination to search for anomalies of the respiratory tract, the heart, blood pressure and blood count, the genito-urinary tract, skin, skeletal system, and a

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<sup>3</sup>Ibid., p. 23.

<sup>4</sup>Darrel Maddox, "Sportspages," The Physican and Sportsmedicine 2 (April 1974): 20.

neurological workup. Add to that an electrocardiogram, urinalysis, and X-rays. Vandeweghe added that he did not believe in a minimum physical because it lulls one into a sense of false security. As with nutrition standards, if minimum is the norm, how can one expect maximum performance? "A doctor taking only blood pressure and not listening to the heart is like a football player wearing only half a helmet."<sup>5</sup>

Rachun<sup>6</sup> and Rose<sup>7</sup> reiterated the concerns stated by Vandeweghe. Rachun, in dealing with the juvenile athlete, urged the physician to go beyond the search for an acute infection or a history of renal, cardiac, or sensory impairment, and take particular care to look for a history of athletic or other injury or chronic musculoskeletal complaints. For example, youngsters with serious head injuries, wobbly knees, mementos of severe ligamentous damage, and recurrent shoulder sprains or dislocations should not be allowed to play football or basketball. Indeed, if a youngster who had a subluxating shoulder problem is permitted to play basketball or football, he stands a very good chance of completely dislocating that shoulder. The

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<sup>5</sup>Ibid.

<sup>6</sup>Alexius Rachun, "The Most Dangerous Game," Emergency Medicine 5 (August 1973): 102.

<sup>7</sup>Kenneth D. Rose, Editorial, The Journal of the American Medical Association 219 (February 1972): 900-901.

physician should take the time to investigate existing or potential problems if he finds them, and should keep the youngster away from sports that might aggravate his condition.

Rachun further cautioned the physician to be realistic when counseling potential athletes in the high school setting. The would-be athlete may see himself blocking a hefty, hard-charging linebacker or moving with Namath-like ease, but the skinny lad with nary a muscle to show for his fifteen or sixteen years of existence or the obviously clumsy, poorly coordinated boy who has never played football before simply is not ready for such a strenuous sport, no matter how strong his determination might be.

The point with all these youngsters is that whatever their disqualifications, the physician should not close the door, but should open one for them. The physical examination is an opportunity for him to evaluate a youngster's physical standing and head him toward a sport that meets his particular needs--one that does not carry a risk for an existing disability or one that permits measured physical development of an underdeveloped boy. There is a wide range of activity from which to choose, and few disqualifications are absolute. Assistance and guidance at this point can be of invaluable consequence to the developing youth in the high school athletic program.

Rose, in speaking of treating adult athletes, also cautioned against the undetected defect in the heart, liver, kidneys, or circulatory system. Blood pressure and age of the athlete constitute hazards from which the physician should take a warning when evaluating the potential athlete.<sup>8</sup>

The subject of physical examination of the athlete does not always confine itself to the preparticipation stage of the medical evaluation sequence. The medical examination is equally important in the evaluation of injury, in diagnosis, and in rehabilitation. Rehabilitation is defined in Webster's New Collegiate Dictionary as "to restore to a former capacity: reinstate."<sup>9</sup> Marshall stated that the first ten minutes of an injury are the most important ten minutes of the total sequence of rehabilitation. A proper medical examination must produce the diagnosis of injury and the initial step in rehabilitating the injured player.<sup>10</sup> The diagnosis of what the trauma appears to be and the medical techniques applied to aid the patient and assist the healing process are paramount considerations in rehabilitation. The pitfalls of missed diagnosis, inept care,

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<sup>8</sup>Ibid.

<sup>9</sup>Webster's Seventh New Collegiate Dictionary, 1970, p. 722.

<sup>10</sup>John L. Marshall, "When Does the Participant Return" (presentation to the Twenty-First Annual Meeting of the American College of Sports Medicine, Knoxville, Tennessee, May 9, 1974).



superfluous prognostication, and lack of proper treatment may cause undue incapacitation or even cripple the athlete.

Pisani outlined a definite time schedule for the treatment of injured knees.<sup>11</sup> He stated that the first twenty-four hours are the most crucial. The diagnosis and testing must be completed in that time because of the pathology the injured knee presents. The ligamentation of the knee, once subjected to injury, becomes gelatinous and quite unmanageable in surgery. If corrective surgery cannot be performed within twenty-four hours of the injury, the next recourse is to attempt a major reconstruction of the knee using adjacent muscle and cartilage.

The orthopaedic examination considerations are the most important to a high school athlete. Hirata stated that the physician should decide who is to compete. The responsibility of decision making should not be delegated to the coach or the trainer.<sup>12</sup> The orthopaedic examination is important because of the fluctuating process of maturation in the high school athlete. The human body experiences an ossification process that begins in the sixth fetal month and concludes with the fusion process in the twenty-fifth year.<sup>13</sup> The fibrous, cartilaginous, and synovial joints are

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<sup>11</sup>Anthony J. Pisani, "Pro Football's Injury Scorecard," Medical World News, November 16, 1973, p. 43.

<sup>12</sup>Hirata, "When to Exclude," p. 79.

<sup>13</sup>Roger C. Crafts, A Textbook of Human Anatomy (New York: The Ronald Press Company, 1966), p. 11.

particularly vulnerable to injury during the years in which epiphyseal ossification is taking place. A diagnosed weakness in any skeletal member should draw immediate attention to the possible consequences of damage that would compound the development process. The human body has twenty-three points of ossification,<sup>14</sup> located in the shoulder, clavicle, elbow, wrist, hip, knee, and ankle. Regarding proper movement, circumduction and rotation depend upon normal growth and strengthening of the skeletal system.

The young athlete may present many more chances for physical injury than an older, physically mature individual. Klafs and Arnheim warned against the dangers of not recognizing the differences between skeletal age and chronological age.<sup>15</sup> The difference between the calendar age and the skeletal age may best be demonstrated in this discussion. The boy who presents himself for the examination with the expressed intent of competing in a sport that has calendar age as a prerequisite should be closely examined to observe if he has the same skeletal strengths and potential for coordination as the age group with whom he is to participate. This also applies to the athlete who is advanced skeletally, but not by calendar age. He may present a problem of noticeable physical superiority, to

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<sup>14</sup>Ibid.

<sup>15</sup>Carl E. Klafs and Daniel D. Arnheim, Modern Principles of Athletic Training (3rd ed.; St. Louis: C. V. Mosby Co., 1973), p. 23.

the point of uncontestable dominance, in his peer group. This situation should come under the purview of the physician.

### Literature Related to the Psychology of Athletics

The subject of athletic psychology is relatively new to the field of athletic medicine. It represents the effort to understand the mental approach to athletics. Virtually every segment of society has been researched regarding the science of the mind. The athletic realm had been ignored until two clinical psychologists, Ogilvie and Tutko of California State University at San Jose, pioneered the research. Coaching staffs had rarely been exposed to athletic psychology and those who had been, as undergraduates, tended to ignore the potential of measuring the motivations of the various levels of athletes they guided in sports. This scene is changing rapidly. Ogilvie and Tutko began their evaluation of the problem athlete in 1964 with a publication of much the same name.<sup>16</sup> An outcome of the research was an acknowledgment that the athlete did have troubles and that the discipline of psychology could be of some use in finding a solution for the various areas of difficulty.

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<sup>16</sup>Bruce C. Ogilvie and Thomas A. Tutko, Problem Athletes and How to Handle Them (London: Pelham Books, Ltd., 1965).

Athletic psychology began at the apex of the athletic ladder--the professional. Professionals used the results from tests conducted by Ogilvie and Tutko. Lyon gave a very fine overview and assessment of the Ogilvie and Tutko psychological scalpel.<sup>17</sup> The test is officially named the Athletic Motivational Inventory, but was referred to by Ogilvie and Tutko as "the instrument." It contains 190 multiple-choice questions designed to measure the subject in eleven personality traits: drive, self-confidence, aggressiveness, coachability, determination, emotionality (handling feelings), conscience development, trust, responsibility, leadership, and mental toughness. Jares related these traits to a pragmatic situation in a professional football camp.<sup>18</sup> The situation demonstrates the position of the coach in regard to his need to understand the thoughts and motivations of his athletes.

The ability of a coach to understand the mental attitudes of his players should be of inestimable value. Psychiatrists have been nurturing the concept that many of the patients they counsel have had their athletic paranoia manifested either by rejection by coaches or by abject

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<sup>17</sup>Leland P. Lyon, "A Method for Assessing Personality Characteristics in Athletics: The Athletic Motivation Inventory" (Master's thesis, California State University, 1972).

<sup>18</sup>Joseph Jares, "We Have a Neurotic in the Backfield, Doctor," Sports Illustrated, January 18, 1971, p. 32.

failure in sports and subjection to ridicule by peer group or from others within the structure of the sport.<sup>19</sup>

The ability to communicate with a young person and respect his individual desires would go a long way toward solving the apathy, disillusionment, emotion, and possible malingerling that subacceptable performance or under-par coaching may generate. The ability to evaluate the skills necessary for success in athletics need not be obtained solely by physical means. Brown stated,

We test them [potential football players] on the four things you can determine absolutely by testing, . . . intelligence, pure speed, agility and ability to learn football. Those things, plus size, you can determine without scrimmage. We put all the players through our tests. The ones who were lacking were sent home. There is no point in scrimmaging a boy you know is not going to make your team. There is no need to bruise him and no need to spend extra time on him. I would rather concentrate my time on the players who will be with me during the season.<sup>20</sup>

Clarke stated that it has been hypothesized and fairly well proven that the athletic stature of the individual is directly related to his personal-social status and academic achievement.<sup>21</sup> Additional studies on the phenomenon of sophomore and junior year drop-outs from

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<sup>19</sup>Thomas Tenbrunsel, Clinical Psychologist, College of Urban Development, Michigan State University, in discussion, December, 1973.

<sup>20</sup>Paul Brown, Head Coach, Cincinnati Bengals Football Club, quoted in Tex Maule, "Rude Welcome Back for Paul," Sports Illustrated, September, 1968, p. 28.

<sup>21</sup>H. Harrison Clarke, "Characteristics of Athletes: The Medford, Oregon, Study," Physical Fitness Research Digest 3 (April 1973): 14-18.

athletics are needed before any correlation among athletic achievement, academic success, and social status is made by educators involved in athletic psychology.

Getze reported his viewpoints of juvenile athletics, which may be the seeding ground for teenage weariness of sports, when he stated the predicament: ". . . In general the conclusion is that the [little] leagues' organization and games are really for the pleasure and benefit of the adults. The boys . . . are like pawns in a chess game."<sup>22</sup>

Obviously, a coach who is aware of and interested in the mental attitude of an athlete can alleviate a good part of the "ho-hum" attitude toward athletics. The athlete usually responds favorably to the face-to-face approach of the coach in regard to any concerns the athlete might have. A cordial relationship, without prostituting authority, can be inaugurated by a coach.

#### Literature Related to the Medical Aspect of Women's Athletics

"With few exceptions women athletes suffer the same injuries as men in the same sports. But they have not been as well cared for as the men," said Sherry Kosek, the first woman to be certified as a trainer by the National Athletic

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<sup>22</sup>George Getze, "Adults Hinder Child's Play," The (Lansing, Michigan) State Journal, October 31, 1973, p. C-1.

Trainers Association.<sup>23</sup> The sudden turn of events in both athletics and athletic medicine has necessitated a new look at the female athlete and a reevaluation of the physical and mental problems that normally beset them.

Wilmore stated that some sports medicine experts are hailing the surge of women into sports as a long-overdue rejection of old wives' tales and the stereotype of the dainty female.<sup>24</sup> Women have received national acclaim for feats of athletic excellence in track, distance running, swimming, tennis, fencing, and basketball.

Today, a seventeen-year-old woman, Lynn Cox, of Los Alamos, California, holds the record for the English Channel swim, twenty-six minutes better than the men's record.<sup>25</sup> And Natalie Cullimore, thirty-three, of San Francisco, was the winner of last year's one-hundred-mile Amateur Athletic Union (AAU) open supermarathon run.<sup>26</sup>

Even young girls are doing what was once considered impossible. Mary Etta Boitano, ten, of San Francisco, has been running the marathon distance of twenty-six miles, 385 yards since she was seven years old. This spring, she placed fourth in the first women's AAU marathon, doing the

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<sup>23</sup>Sherry Kosek, "Sportspages," The Physician and Sports Medicine 1 (June, 1973): 15.

<sup>24</sup>Jack H. Wilmore, "The Compleat Athlete?" Medical World News, May 24, 1974, p. 35.

<sup>25</sup>Ibid.

<sup>26</sup>Ibid.

distance in three hours and one minute.<sup>27</sup> A fourteen-year-old, June Chun, was an unofficial fifth among the women, finishing in a fraction over three hours at the recent Boston Marathon, which bars runners under eighteen as official entrants.<sup>28</sup>

Women are not without their physical limitations when they participate in sports. Kirk, Ansell and Bywaters called for proper regard for the female anatomy by athletes and physicians.<sup>29</sup> They stated that, anatomically, the knees of the male and female athletes are identical, but that clinical studies show the following differences:

(1) Women do not appear to tolerate pain in the knee as well as men, (2) patellar (knee cap) injuries are more frequent in women, and women's knee joints generally are looser and more hyperextensible than men's. Hughston further advised that patellar instability in most cases is a result of congenital laxity of the quadriceps mechanism.<sup>30</sup>

Lichter advised that the loose-jointed woman athlete can avoid trauma if a proper medical evaluation is given and

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<sup>27</sup> Ibid.

<sup>28</sup> Ibid.

<sup>29</sup> J. A. Kirk, B. M. Ansell, and E. G. Bywaters, "The Hypermobility Syndrome," Annual of Rheumatic Diseases 26 (1967): 419.

<sup>30</sup> J. C. Hughston, "Subluxation of the Patella," Journal of Bone and Joint Surgery (Am.) 50 (1968): 1003.



possible remedial exercises are performed to strengthen the knee.<sup>31</sup>

The subject of little league baseball and its effect on youth has been discussed in increasing volumes in the past few years. Torg<sup>32</sup> and Patrusky<sup>33</sup> stated the case for relaxation of pressures upon the children to be instant winners. The losers in many instances become the possessors of defeatist attitudes that continue on into adult years.

To compound the problem of youth and little league, we have witnessed the ability of the young female baseball player and her desire to compete on an equal basis with the boys. Torg and Torg wrote on the medical-legal aspects pertaining to preadolescent girls and their proposed place in the ranks of little league baseball players.<sup>34</sup> Hale<sup>35</sup>

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<sup>31</sup>Joseph Lichtor, "The Loose-Jointed Young Athlete: Recognition and Treatment," The Journal of Sports Medicine 1 (September/October 1972): 22.

<sup>32</sup>Joseph Torg, "Little League: The Theft of Carefree Youth," The Physician and Sportsmedicine 1 (June 1973): 72-78.

<sup>33</sup>Benjamin Patrusky, "The Secret Psyche of the Peewee Sportsman," The Physician and Sportsmedicine 1 (June 1973): 82-86.

<sup>34</sup>Barbara G. Torg and Joseph S. Torg, "Sex and the Little League," The Physician and Sportsmedicine 2 (May 1974): 45-50.

<sup>35</sup>Creighton J. Hale, "The Compleat Athlete," Medical World News, May 24, 1974, p. 37.

and Sheehan et al.<sup>36</sup> expressed two differing viewpoints, both fortified with medical logic, on why preadolescent girls should be allowed to participate in little league baseball. Hale would bar any competition whatever, while the majority of the protagonists see no danger, medically or psychologically, in the involvement of girls in little league.

#### Literature Related to Athletic Equipment Safety

The safety of athletic equipment has received little attention as a cause for concern. Various sports have their inherent hazards: Track has the three-quarter-inch spike on the shoe, and coaches have always stressed the danger of running up the back of a competitor's leg. The javelin has injured a number of field contestants, but this has usually been an area problem. Baseballs annually injure thousands of players, in various degrees of trauma. Basketball, swimming, wrestling, and tennis all have their moments of bodily insult. Nevertheless, the majority of athletic injury stems from an improper physical approach to the game. A lack of physical conditioning, disregard for the rules, i.e., allowing a noncontact sport to become a contact sport, or a flagrant display of bravado with an overt disregard for personal safety are some examples. The result of such

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<sup>36</sup>George Sheehan et al., "The Compleat Athlete," Medical World News, May 24, 1974, pp. 36-68.

actions can cause accidents, and these accidents take only a minute to occur. The medical profession accepts these occurrences as unavoidable; however, little attention is given to the safety factors of sports in which predesigned collision is not part of the game. As a result of this seemingly arbitrary neglect of noncontact sports, little has been written about the equipment used in those sports.

The emphasis in the literature pertaining to equipment is directed primarily to football. Garrick articulated the usage of the football helmet in both the preinjury stage and the post-injury setting.<sup>37</sup> The ability to remove the helmet from a player who has sustained a cranial injury or a cervical spine injury necessitates great skill and planning, and involves a life-and-death situation. Morehouse researched the safety design features of both the football helmet and the face mask. He found that the face guard has reduced the number of fractured noses and cheekbones in football, but because the face guard inadvertently acts as a "handle," it may trade face injuries for neck injuries.<sup>38</sup>

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<sup>37</sup>James G. Garrick, "Sideline Decisions: A Practical Approach to Clinical Recognition and Immediate Management of Injuries in Athletes" (paper presented to the Twenty-First Annual Meeting of the American College of Sports Medicine, Knoxville, Tennessee, May 9, 1974).

<sup>38</sup>Chauncey A. Morehouse, "Helmets, Faceguards and Better Football," The Physician and Sportsmedicine 1 (November 1973): 32.

Hall stated that direct injuries to the head, neck, and spinal cord cause the highest percentage of deaths in football.<sup>39</sup> To illustrate the point, the varsity fullback for the Michigan State University football team during the fall of 1973 cracked five football helmets in the course of the season. In addition, it was observed that the team's football helmets were not constructed to keep the metal frames that cover the face from bending in toward the nose and mouth area; such was the force of impact between one player and another, or between player and playing surface.<sup>40</sup>

Adkison et al. stated there can be little doubt that, aside from questions raised relating to safety, synthetic turfs offer advantages over natural turf.<sup>41</sup> However, the results of the high school football injuries study in Seattle, Washington, revealed that of the three major field types studied, the Astro Turf fields had significantly higher injury rates than did grass or Tartan Turf. Grass had an intermediate number of injuries per

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<sup>39</sup>Wesley H. Hall, "Sports Medicine Editorial," The Journal of Sports Medicine 1 (September/October 1972): 19.

<sup>40</sup>Martin Daly, Athletic Equipment Manager, Michigan State University, in discussion on athletic headgear, November, 1973.

<sup>41</sup>John W. Adkison et al., "Injury Rates in High School Football: A Comparison of Synthetic Surfaces and Grass Fields," accepted for publication in Clinical Orthopaedics and Related Research, 1973.

game, and Tartan Turf had the lowest injury rate. Thus the alteration of a single environmental variable (in this case the playing surface) had a significant impact on the frequency with which injuries were sustained.

Torg conducted a study that probably has been as significant a deterrent to injury in football as anything that has been published in the past several years.<sup>42</sup> Within the Torg study, the recommendation for soccer-type cleats was issued. The soccer-type cleat has a shorter length, but there are more of them on the sole of each shoe. Some soccer shoes have as few as fourteen cleats and some as many as twenty-two nipple-type cleats. The new cleat is part of a molded sole, which is a poly-plastic compound and can break a vertical grip with the playing surface with less horizontal or diagonal torque force. The old cleat was a threaded, screw-on type of device that was either steel, aluminum, or plastic with a metal threaded sheath. Within the medical profession the dominant thought is that the Torg report has conclusively presented a positive argument that knee and ankle safety is better assured with the soccer-type cleat. It might be assumed that high schools that adopt this style of footwear should have better safety records with regard to knee and ankle injuries.

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<sup>42</sup>Joseph S. Torg, "Effect of Shoe Type and Cleat Length on Incidence and Severity of Knee Injuries Among High School Football Players," Research Quarterly 42 (May 1971): 203-211.

O'Donoghue stated that all players should have their ankles wrapped prior to practices and games.<sup>43</sup> The subject of ankle support is appropriate in this discussion because it has generated more comment and debate than any other article of safety equipment. Ryan stated,

Increased professional recognition must be justified by prompt elimination of "folklore" treatment. . . . In short, we must be able to provide sound reasons for what we do or we should stop. It is a well-documented fact that good intentions do not guarantee good results nor do they guarantee any results at all.<sup>44</sup>

This statement applies to the beliefs that surround the commonly accepted practice of taping ankles. The ankle joint, unlike the knee joint, is not supported by strong muscles. The only powerful muscle group that crosses the ankle joint with its tendon is the gastrocnemius soleus, and it lies too far posterior to serve as a stabilizer. Thus, there is no possibility of strengthening the ankle by exercising the muscles whose tendons cross the joint. Additionally, Ryan stated that no one has yet demonstrated in the adult human that ligaments can be strengthened with exercise, although this apparently is possible in animals.<sup>45</sup> O'Donoghue supported Ryan's statement, but believed that use

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<sup>43</sup>Don H. O'Donoghue, Treatment of Injuries to Athletes (Philadelphia: W. B. Saunders Company, 1962), p. 26.

<sup>44</sup>Allan J. Ryan, "Taping Prevents Acute and Repeated Ankle Sprains," The Physician and Sportsmedicine 1 (November 1973): 40.

<sup>45</sup>*Ibid.*, p. 41.

of tapes is a measure that should be reserved for rehabilitating an ankle injury.<sup>46</sup>

Ferguson's viewpoint aptly presented the opposition to Ryan. Ferguson stated there is evidence to indicate that taping may have a deleterious effect, and instead of preventing injuries taping may aggravate them.<sup>47</sup> A major factor working against the presumed benefit of taping--the rigid support of the athlete's ankle--is the mobile nature of the skin itself as it moves over the subcutaneous tissue that in turn moves over the bones and ligaments taping is intended to reinforce. Thus, taping is inefficient at the start, and, as moisture accumulates beneath the tape, skin adherence is lessened still further. As an injury preventative, then, taping can be seen to have little actual effect. Calf muscle buildup is one of the most important measures to prevent ankle sprains. The rolling motion of the subtalar joint, just beneath the ankle, inverts and everts the foot and acts as a "safety valve" for the ankle joint and knee, stabilized by the muscle of the calf. The false security of taping not only tends to diminish tone in these muscles, but also acts to inhibit the natural injury preventative motion of

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<sup>46</sup>O'Donoghue, op. cit., p. 27.

<sup>47</sup>Albert B. Ferguson, "The Case Against Ankle Taping," The Journal of Sports Medicine 1 (January-February 1973): 46.

the subtalar joint.<sup>48</sup> Rarick presented an argument similar to Ferguson's.<sup>49</sup> Rarick contended that the stress of activity quite rapidly loosens the tape and leaves the ankle with little actual protection. This is further evidenced when the locker room procedures in most high schools include the taping of the "star" athlete first as a matter of protocol, but the action actually leaves that athlete with the poorest support by game time merely because he has had it on for the longest period of time.

Kozar took a neutral position on the topic of taping. He contended that ankle taping does not significantly improve the dynamic balance of athletes.<sup>50</sup> Kozar reported that the two most common responses by athletes, regarding the effects of taping on their production, were: (1) They felt that having their ankles taped restricted their flexibility at the ankle joint, which hindered their performance; and (2) They felt that fatigue set in sooner as a result of the taped ankles.<sup>51</sup>

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<sup>48</sup>Ibid.

<sup>49</sup>G. Lawrence Rarick et al., "The Measurable Support of the Ankle Joint by Conventional Methods of Taping," Journal of Bone and Joint Surgery 44 (1962): 1183-90.

<sup>50</sup>Bill Kozar, "Effects of Ankle Taping Upon Dynamic Balance," The Journal of the National Athletic Trainers Association 9 (June 1974): 96.

<sup>51</sup>Ibid.



### Summary of the Literature

The literature related to the physical examination of the athlete stressed the need for a thorough scrutiny of the potential athlete, both physically and mentally. Many physicians, as a result of their degree of involvement with athletes, believe there is no finalization to the physical examination. The limits imposed upon the physician, in his conduct of the examination, are dictated by time, patient cooperation, and monetary constraints.

The literature related to athletic psychology is directed to two fertile research fields--the motivational traits displayed by athletes in their individual sports and the area of youth athletic competition. The ability to understand why a person wishes to participate in a sport has never been advanced concerning high school athletics. The growing hypothesis that youth sports may be detrimental to proper mental and physical development has become a cause for concern in the education field. The literature is quick to question the necessity for intense competition before the high school age group in the fourteenth year of life. The principal authors on the subject have their reservations on the merits of highly organized sports programs for youth in pre-high school years.

The literature pertaining to the medical aspect of women in athletics calls for a reevaluation of the physical

capabilities of women athletes. The revelation that is predominant in the literature is that women "can do," "desire to do," and "will do" in the field of competitive sports. The concern is that the female musculoskeletal system, although very similar in structure to the male counterpart, does not have the strength in musculation, nor does the female physique readily adapt itself to becoming muscled. Additionally, the medical "knowns" that pertain to the medical aspect of females in sports are far behind the "unknowns." Much research must be undertaken if the proper niche is to be assumed by the female athlete. The female role in little league baseball, "Pop Warner" football, and peewee hockey will have to be resolved before contact and collision sports have tragic effects upon the developing anatomy of the young female athlete.

The literature that discusses safety in athletic equipment has been written by a small segment of the medical researchers who have an interest in athletics. There seems to be a hesitancy to publish information that runs contrary to traditional beliefs. Pure medical research on football equipment has been late on the publishing scene. There are only a few good reports on playing surfaces, footwear, supportive orthopaedic equipment, proposed rule changes for athletic safety, and protective head gear.

Only incidentally has medical research directed any of its well-endowed investigation to the realm of the high school athlete. For whatever reason, there is a conspicuous absence of research literature that addresses the maturing young adult high school student as an athlete and supports him in that environment.

## CHAPTER III

### DESIGN OF THE STUDY

This chapter consists of a description of the population, method of selection, and reason for the selection of the respondents. It includes a description of the methodology, a statement of the research categories, and an explanation of the reasoning and data treatment employed in the analysis.

#### Definition of Population and Samples

The population selected for this study consisted of both three- and four-year senior high schools in Michigan. The qualification for selection was that each high school be a member of the Michigan High School Athletic Association. The membership of the Michigan High School Athletic Association, in September, 1973, was 709 private, public, and parochial high schools. The schools were divided into four classes for purposes of equitable athletic competition.

Seventy high schools were selected from each class, using the technique of sampling explained by Raj.<sup>1</sup> The

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<sup>1</sup>Des Raj, The Design of Sample Surveys (New York: McGraw-Hill Book Company, 1972), p. 32.

high schools were selected from the roster of members listed in the Michigan High School Athletic Association Bulletin.<sup>2</sup> The number of high schools selected was 280, which represented 39.52 percent of the total number of high schools in the state.

The survey incorporated sixty-two counties in both the Upper and Lower Peninsulas of the state. Eleven counties were not included in the survey. They were Delta, Keewenaw, Luce, Ontonagon, and Schoolcraft in the Upper Peninsula and Alpena, Crawford, Lake, Mason, Mecosta, and Roscommon counties in the Lower Peninsula. There was no overt attempt to exclude these counties from the survey. Their omission was merely a by-product of the selection process.

The size of the sample, seventy high schools from each of four classes, was decided upon after discussing the survey with McSweeney and Schmidt.<sup>3</sup> They referred to the potential return percentages as being most crucial to the success of the survey. It was their stated opinion that seventy high schools from each class was more than adequate if a return of 75 to 80 percent was finalized for evaluation.

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<sup>2</sup>Michigan High School Athletic Association, Bulletin 49 (November 1972).

<sup>3</sup>Mary Ellen McSweeney and William H. Schmidt, faculty members, Department of Counseling, Personnel Services and Educational Psychology, Michigan State University, in discussion, April, 1973.

Backstrom and Hursh stated that there is no set percentage of any given population that is considered standard.<sup>4</sup> The size of the sample in relation to the population is generally irrelevant in field surveys.<sup>5</sup> Raj stated that "representative" samples actually cannot be defined.<sup>6</sup> Apparently no set percentage of any population is considered helpful. Raj further stated that if we attempted to select a miniature population from the larger population, we would not know how.<sup>7</sup> Therefore the advice of McSweeney and Schmidt became the reason for the selection of seventy high schools in each class for the survey.

The principal officer for each school was the designated respondent of the survey questionnaire. This procedure was recommended by Robert James, Secretary-Treasurer of the Michigan High School Coaches Association. In his opinion a high school principal was more likely to give an accurate assessment of his high school's capability regarding medical care for athletes than was any other potential respondent. Second, the principal would probably insure a reasonably expeditious return of the questionnaire to the researcher. Third, the questionnaire sent to the

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<sup>4</sup>Charles H. Backstrom and Gerald D. Hursh, Survey Research (Evanston, Illinois: Northwestern University Press, 1962), p. 28.

<sup>5</sup>Ibid.

<sup>6</sup>Raj, op. cit., p. 5.

<sup>7</sup>Ibid., p. 6.

principal would identify the fact that there is an interest in the welfare of the high school athlete in a college of medicine in the state of Michigan. Furthermore, the ultimate goal of the research emanating from the Department of Biomechanics (through this researcher) would be to attempt to design models of education and vehicles of service to improve the health care capabilities of each high school. Any viable changes in the existing health care that are advocated by medical authority will need support from the secondary school administrators. With the principal being the respondent to this questionnaire, a significant part of the political apparatus will have been involved on a preliminary basis.

It may well be that the actual supplier of information was the athletic director or the coach of a particular sport. The fact remains that the principal was the acknowledged respondent and thus knew of the intent of the survey.

The survey was mailed to the intended respondent, by name, the last week of September, 1973. The name of each principal was taken from the Michigan High School Athletic Association Bulletin, Directory Issue, of 1972. The main office of the Michigan High School Athletic Association revised the list of names they knew had changed during the time lapse following directory publication. The September mailing time was selected because it seemed

appropriate to correspond with principals after their schools had been open for three weeks to a month.

Several school districts in the Detroit, Saginaw, and Flint areas were delayed in opening for the fall classes because of disputes over contractual clauses between teachers and the representative school boards. As a consequence, several questionnaires were returned to the researcher in late November from schools in those areas, with letters attached explaining the predicament and the reason for a tardy reply.

Each questionnaire was accompanied by two enclosures. The first was a letter of introduction from the researcher relating the intent of the survey, the sponsor of the survey, and that the goals of the survey were endorsed by the Michigan High School Athletic Association and the Michigan High School Coaches Association. As mentioned in Chapter I, both of the endorsers were consulted at the outset of the survey proposal for input of ideas for the questionnaire. In the opinion of the researcher, the high survey return was directly attributable to the effort and cooperation of both Associations.

The second enclosure was a self-addressed post card to be completed by the respondent, soliciting only the name of the school, its address, and zip code. It was to be returned under separate post, to the researcher. Table 3.1 shows the rate of post card return.



Table 3.1.--The rate of return of high school identifier postal cards.

Class	Number Mailed	Number Returned	Percentage
A	70	48	69%
B	70	51	73%
C	70	48	69%
D	70	41	59%
Total	280	188	67%

In addition to the 188 total post card returns, two cards were received with illegible addresses. The postal card returns provided a general awareness of what areas of the state were complying with the request to assist in the study.

Before any further description of the study, it should be noted that the respondent was guaranteed anonymity of response. The success of the findings was predicated upon honest and realistic answers. Had the questionnaire not given this guarantee, the respondent quite possibly might have portrayed a much more positive picture of the situation in the high school. In light of the fact that the questionnaire asked some rather specific questions that could cause embarrassment, for a number of reasons, it was decided that there should be no way to single out a school that was not complying with Michigan High School Athletic

Association directives or one that had a poorly organized medical care structure for the interscholastic athlete. The only way a school could be identified was by class. This was accomplished by printing the questionnaire on four colors of paper. Class A high schools received yellow questionnaires, Class B green, Class C blue, and Class D white questionnaires. The last request was that the respondent circle the class of school to which his institution belonged. A row of letters--A, B, C, and D--was placed at the end of the questionnaire and was indicated to be the only class identifier in the survey. Of all the questionnaires received, only two had a certain color code and an inappropriate letter circled, which indicated that the majority of the respondents attempted to be honest and accurate in their replies.

The final edition of the questionnaire was a result of three prior questionnaires that had been circulated among physicians, athletic trainers, and educators on the campus at Michigan State University for comments, questions, or additions. Sample questions were also given to high school basketball, football, and swimming coaches in the Ingham County area. In all, fourteen sample questionnaires were disseminated. The final questionnaire was a compilation of the suggestions offered by the fourteen initial respondents. A copy of the questionnaire may be found in Appendix A.

### Design of the Study

The design of the study was calculated to elicit a comprehensive overview of the facilities, staffing, medical supportive methods, and planning that the high schools promote with regard to the interscholastic athletic program. The questionnaire was designed to identify the health care delivery system by asking questions that were easily identifiable and within the scope of the athletic program supported by the high school. If a program was not in effect in the high school, the respondent could easily indicate this void in the structure of the athletic department. An example of this type of questioning would be: "Do you have a physician at all home games?" If the answer was yes, there apparently was no medical assistance problem at home games. If the answer was no, then there was a medical assistance problem area. Regardless, the answer sought was either a "yes" or a "no." This method of questioning attempted to bring to the respondent's attention an area that needed consideration: The high school should procure the services of a physician for all home games. The questions were intended to be a reminder that athletic medicine is a significant concern in an interscholastic athletic program. If the respondent gave a positive answer, there was a correlation between what was considered necessary and what was actual practice within the high school athletic program. If the answer was negative,

it was hoped the question would raise issue with the administrator and initiate action to alleviate the condition.

The questions asked were considered important for a total understanding of the proper administration of a health care capability in high school interscholastic athletics. A hypothetical athlete was considered from the first day of any athletic competition. Every medical sequence that should be available to the individual athlete was included in the questionnaire. Included were the physical fitness examination, the psychological adaptability of the potential athlete, the training regimen for preparation in a particular sport, the available medical care and type, emergency medical facilities and equipment, medical training of all personnel involved with the athlete, and rehabilitation of the injured athlete.

In addition to the pertinent medical situation questions, inquiries were made about the types and conditions of various surfaces upon which teams played. Basketball, track, and football contests are conducted upon different types of surfaces. Furthermore, information on the condition of the playing surfaces was desired. The time of day allocated for practice was requested. The types of sports sponsored by the high school and what levels of participation were called for by sport, sex, degree of competition (varsity or junior varsity).

Finally, the respondents' opinions were invited with regard to the areas of educational change needed in the university setting. The most expeditious assistance for any school system, regarding their medical care for athletes, was envisioned to begin in the university. It may well be that the extension course offerings by several state-supported institutions could provide the education in athletic training to existing high school faculty. This would upgrade considerably the present potential for adequate medical coverage. The second option is to change the undergraduate curriculum so that it better prepares physical education majors and minors to contend with the medical needs of an athlete that do not necessarily demand a physician's attention. Impressions and ideas on potential future courses in colleges and universities that would benefit the high school athletic programs were also solicited.

#### Statement of Research Categories

The following questions were intended to represent six categories of inquiry that would best elicit the information necessary for proper evaluation of the medical care capabilities of the interscholastic athletic programs in Michigan high schools. The categories were not original to this study. They have been topics of discussion for many individuals and groups for a number of years. Two physicians

who articulated the questions best were Nicholas<sup>8</sup> and O'Donoghue.<sup>9</sup>

The six categories under consideration were:

(1) physical medicine, (2) athletic training, (3) athletic equipment, (4) athletic medical education, (5) records of athletic trauma and rehabilitation, and (6) athletic medical-legal aspects.

#### Category 1

1. How many teams do not have a regular physician?
2. Are preparticipation physical examinations comprehensive; is there an existing standardized physical examination form?
3. Is the medical coverage for an athletic contest adequate?
4. Is the emergency care constant and satisfactory in the case of injury to athletes?

#### Category 2

1. Do coaches possess the necessary fundamental knowledge of athletic injury frequencies and proper treatment of injuries occurring in their sports?
2. Do Michigan high schools have adequate supportive medical assistance for team athletics or solo athletes in the person of a certified athletic trainer?
3. Do Michigan high schools possess the appropriate emergency equipment that could avoid catastrophic asphyxiation resulting from athletic trauma?
4. Do Michigan high schools support athletic training and physical development of individual athletes both in season and out of season?

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<sup>8</sup>Nicholas, "The House that Nicholas Built," pp. 72-79.

<sup>9</sup>O'Donoghue, Treatment of Injuries.

Category 3

1. Do Michigan high schools have the proper equipment for each sport? Do they have the proper facilities?

Category 4

1. Is there an adequate flow of up-to-date, essential knowledge on athletic medical technique and research to the team physician and the athletic staff?

Category 5

1. Is a standard nomenclature of athletic injuries and diagnosis being used among the high schools?
2. Is an audit system being used in the recording of athletic injuries?
3. Is there historical data pertaining to the categories of physical examination through the rehabilitation progress and final clearance for full participation in a sport?

Category 6

1. What is the procedure for the assumption of medical liability; by the physician? by the high school? or by the third party insurance?

Analysis of the Data

Responses in the six categories were summarized by comparing the responses among classes A, B, C, and D and also by comparing each class to the state percentage for each question. Simple rather than statistical comparisons were used. Percentages were employed because of the ease of comparison within the columnar display of multiplicate numbers. The objective of the survey was to identify areas of medical care and general athletic safety that exist in

the high school population of the state of Michigan. The investigation did not attempt to assess or identify any significant gradient of excellence among classes.

It was believed that percentile data would net, at best, topics for discussion among various groups that either govern the high school athletic programs or seek a vehicle for change in the existing policies concerning the student athlete and the medical profession. The percentile data will be evaluated by the Michigan High School Athletic Association; the Michigan High School Coaches Association; the Great Lakes Chapter of the National Athletic Trainers Association; the Department of Health, Physical Education and Recreation, Michigan State University; the Division of Athletic Medicine and Research, Department of Biomechanics, Michigan State University; and the Department of Exercise Physiology, University of Michigan.

The method of evaluation was to identify the "have" and "have not" areas in the medical care sequence in the high school athletic programs. The opinions gathered were expected to provide insight to the problems in the health care of the high school athlete. The direction and magnitude of an educational model designed to assist the high schools in educating faculty to care for various facets of health care administration depends on the respondents' replies concerning health care delivery. In addition, the identification of paucity areas in any of the aforementioned



six categories of questioning may provide motivation to additional, more selective research in those areas of concern.

### Summary

The total sample of the study consisted of seventy randomly selected high schools from each of the four classes of athletic competition prescribed by the Michigan High School Athletic Association. A total population of 216 high schools participated in the survey, which represented 31 percent of the total population of 709 member high schools of the Michigan High School Athletic Association. Sixty days from the original mailing, follow-up letters were sent to all high school principals from which a postal card reply had not been received.

The study population was requested to answer the questions on a survey form covering the topics: physical medicine, athletic training, athletic equipment, athletic medical education, records of athletic trauma and rehabilitation, and athletic medical-legal considerations.

The analysis was accomplished by an evaluation of the responses, with a correlated discussion of the topics by members of the medical and education professions who have addressed the field of athletic medicine through articulated research projects or in professional publications.

## CHAPTER IV

### PRESENTATION OF DATA

This chapter contains the results of the investigation. Each question is restated, accompanied by the data and discussion. The questions are presented in the order in which they were presented on the questionnaire. Each of the six categories mentioned in Chapter III is discussed as a unit in Chapter V. To simplify the presentation, the "no answer" category has been omitted. The percentages are based on the 100 percent maximum. Consequently, any columns that total less than one hundred had the remainder represented in the "no answer" category.

It is appropriate to establish one basic understanding at this point in the discussion. In the following discussion, the athlete or groups of athletes referred to are high school athletes. The specific age group is post-pubescent, including males and females from thirteen to eighteen years of age. This distinction should be noted because the medical concerns for the high school athlete many times deal with both mental and physical maturation. Because of the period of growth that this age group represents, medical care for the high school athlete is significantly different than it is for the mature individual.

Question 1

Does your high school have a regular team physician  
(under contract for services)?

Table 4.1.--Distribution of contract team physicians in  
Michigan senior high schools.

	Class A	Class B	Class C	Class D
Yes	52%	31%	18%	8%
No	48%	69%	82%	92%

The respondents volunteered several explanations that serve to alleviate some of the questions about why so few high schools have regular physicians. The respondent population did not universally understand the meaning of regular physician, and that was the fault of the questionnaire. The physician scarcity in some areas of the state has necessitated the request for services, on both a pay and nonpay basis, of interns from local hospitals. In many instances the intern has either had an interest in the team or the sport, or he has looked upon the experience as a learning practicum. All interns are licensed physicians in the state of Michigan. Thus in cases where an intern was in attendance, the necessity for the presence of a physician was satisfied.

Question 2

Is the same physician engaged for all sports physical examinations?

Table 4.2.--Relationship of contracted team physician to physical examinations for all interscholastic student-athletes.

	Class A	Class B	Class C	Class D
Yes	37%	39%	40%	40%
No	61%	51%	50%	41%

This set of figures was the first indicator that the physical examination standards are diverse because of the acknowledged change in physicians. The Michigan High School Athletic Association has a recommended physical examination listing, but it is not mandatory. This raises an additional question on the subject--having an annual standard physical examination that must be satisfied in every category for each high school athlete in the state of Michigan. The lack of 100 percent response to this question may be an indication that the nonrespondent schools did not know the answer (which is indicative of poor management), did not have physical examinations for all sports, or did not have a team physician. In the future, a question that may need to be answered is why the schools seemed to experience such an apparent turnover of physicians, as indicated by the replies to the initial question.

Question 3

Is the specialty of the team physician:

- a. Family practice (general practice)
- b. Orthopaedics
- c. Internal medicine
- d. Physical medicine
- e. Other (please state)

Table 4.3.--Medical specialties for respondent schools' team physicians.

	Class A	Class B	Class C	Class D
Family practice	48% <sup>a</sup>	55%	48%	46%
Orthopaedics	11%	13%	4%	2%
Internal medicine	2%	2%	--	2%
Physical medicine	4%	1%	2%	--
Other <sup>b</sup>	5%	--	--	--

<sup>a</sup>All percentages represent affirmative answers.

<sup>b</sup>The 5 percent in Class A represents the write-in of another specialty--physiatry--the specialty of physical medicine with an emphasis on physical rehabilitation.

In this question the totals of all specialties in class C and D barely exceeded 50 percent. Either the questionnaire neglected to include a specialty or specialties that could account for the remaining percentages, or the respondents did not know what facet of medicine their team physician represented.

Question 4

Is the team physician in attendance at all home football games?

Table 4.4.--Attendance of team physician at home football games.

	Class A	Class B	Class C	Class D
Yes	82%	63%	44%	27%
No	13%	27%	42%	46%

The obvious lack of physician attendance, especially in the descending order by class, might be satisfactorily explained if the variables could be identified. The examining physician may have estimated that the most important aspect of his athletic medicine role was satisfied with the physical examination. Second, the availability of the physician may have been nil, and para-professionally trained people substituted.<sup>1</sup>

Trained para-professionals are usually acceptable medical deputies if they have board certification in any of

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<sup>1</sup>The subject of substitutes for physicians in attendance at athletic events has been brought up for discussion in Pennsylvania. A growing lobby in Harrisburg is suggesting to legislators that the chiropractic profession is capable of being given state credential to perform athletic physical examinations and to be in attendance at high school athletic contests. The impact of any favorable legislation regarding the chiropractic profession could be felt in Michigan.

the emergency medical fields or first-aid-oriented fields of employment. If a physician is on call, most athletic events can proceed safely with a para-professional in attendance. The idea that a specialist or a general practitioner needs to be in attendance at all athletic events is not universally accepted in the medical profession.<sup>2</sup>

#### Question 5

Is the team physician in attendance at all or some of the away games?

Table 4.5.--Attendance of team physician at away football games.

	Class A	Class B	Class C	Class D
All	32%	11%	12%	6%
Some	32%	44%	42%	19%
None	29%	32%	30%	48%

This question was included in the survey simply to attain a better understanding of the completeness of medical coverage the high school athlete was receiving. Many teams compete against other high schools that do not have a physician in attendance. This question points out the need

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<sup>2</sup>James G. Garrick, "Type and Frequency of Injuries in Sports and the Decision-Making Process" (paper presented at the Twenty-First Annual Meeting of the American College of Sports Medicine, Knoxville, Tennessee, May 9, 1974).

for a coach or administrator to obtain advance knowledge of the lack of a physician at the away playing site. Additionally, they should determine the availability and qualification of any possible emergency service in the visited community.

#### Question 6

Do you have a standard physical that student-athletes must successfully complete to qualify physically for interscholastic competition?

Table 4.6.--Adherence to a standard physical examination for high school athletes.

	Class A	Class B	Class C	Class D
Yes	93%	92%	92%	90%
No	5%	8%	6%	10%

The word "standard" was ambiguous in this question. A standard physical is recommended by the Michigan High School Athletic Association; it suggests evaluation of the examinee in nine categories that can be surveyed by the medical examiner. In contrast, if several physicians were to set their own standards for a physical examination, the examinee being the high school athlete, several differing formats would govern the examination.



Question 7

Of the following categories, how many are used by your school in physician evaluation of the potential student-athlete?

Table 4.7.--Presentation of nine subjects of medicine constituting a comprehensive physical examination and the percentages of usage of each by Michigan high schools.

	Class A	Class B	Class C	Class D
Blood pressure	77%	58%	64%	71%
Family medical history	38%	37%	24%	35%
General physical condition	71%	73%	66%	81%
Personal medical history	50%	47%	34%	33%
Emotional stability	14%	10%	10%	6%
Cardiology evaluation	66%	39%	52%	46%
Orthopaedic examination	39%	24%	36%	29%
Eye examination	25%	42%	30%	29%
Neurologic evaluation	14%	19%	12%	13%

Note: Positive identification answers are given.

Although the nine subjects stated in the question are representative of what should be done on a physical examination, they do not, collectively, represent a "standard" physical examination. There is no standard or universally

accepted examination on record. However, several noted physicians have approved of all nine subjects in their respective writings. O'Donoghue,<sup>3</sup> Klafs and Arnheim,<sup>4</sup> and Rachun<sup>5</sup> all stated these subjects should be covered in a comprehensive physical examination.

Blood pressure. Perhaps the most basic indicator of pathological dysfunction is blood pressure. Blood pressure indicates the body hydraulics and pressures exerted upon the heart. Should the pressure become higher than the limits expected by medical calculation, for any given age and weight group, the potential for morbidity or mortality increases proportionately. A blood pressure check takes a maximum of three to four minutes.

Family medical history. Recording a family medical history is a basic part of virtually every medical practice. The information gleaned from knowledge of the family's traits and habits contributes to an overall understanding of any given individual in that family. The ethnic origin, nutritional preferences, religious beliefs, and a host of other characteristics become inferences to certain types of pathology. Add to this the social and demographic considerations,

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<sup>3</sup>O'Donoghue, Treatment of Injuries, p. 36.

<sup>4</sup>Klafs and Arnheim, Modern Principles, p. 20.

<sup>5</sup>Rachun, "The Most Dangerous Game," p. 100.

and a competent physician has an excellent start on a data base.<sup>6</sup>

General physical condition. The general physical condition is self-explanatory. The word "general" indicates a great deal of flexibility in what the examination entails. In many instances the examination is so general that the physician performs only a cursory visual examination, culminating with the visual check for hemorrhoidal tissue at the anal sphincter. Alternatively, the general physical condition may involve palpation of various soft tissue regions to ascertain the general well-being of the examinee.

Personal medical history. Hirata's statement regarding the difficulty of obtaining an accurate medical history underlines the basic reason why there is a paucity of personal medical histories, as reported by the present survey.<sup>7</sup> A more intense effort at health education of the student and accessibility to the athletes by the physician may alleviate the obvious problem of no background knowledge on each potential athlete.

Emotional stability. This subject has been ignored because it has been an unknown area of involvement. Few coaches have wished to become implicated with an athlete who has a mental problem, and will shy away from any positive

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<sup>6</sup>Weed, The Problem-Oriented System, p. 23.

<sup>7</sup>Hirata, "When to Exclude," p. 79.

identification method that will aid in isolating the causes of any mental hiatus in athletes. There is no general area of understanding on this subject. The athlete who craves physical contact is looked upon by many other athletes, in noncontact sports, as being different. Whether or not the various differences in athletics constitute a need for a motivational testing schematic has yet to be determined. The coach and physical educator of the future will need a great deal more understanding of the mental process of their athletes.

Cardiology evaluation. The cardiology evaluation can be measured in several ways. First, if the examination consists of palpation and stethoscopic exploration, the limitations of potential findings are preordained. The heart sounds can give the physician indicators of strength, volume, and rhythm of blood flow, but not much else. Some physicians have indicated this examination represents an adequate cardiology evaluation of the young athlete. Virtually every high school physician who conducts this form of evaluation endorses it pro forma.

The main reason for a physical examination is to identify irregularities in growth or pathology of importance in human development. The major finding of a perfunctory examination may be an enlargement of the heart, or "athlete's heart" as it is commonly referred to by physicians. In the past two decades there has been a break in the belief that

an enlarged heart indicates potential danger. In fact, the belief that competition in the sports arena brought an early death was endorsed by Hippocrates and Galen, and the view prevailed into the twentieth century.<sup>8</sup> Ryan stated that cardiac enlargement unquestionably occurs in the young athlete, both because the heart muscle fibers become thicker and stronger with heavy exercise and because the chambers dilate. Both these responses are adaptive and advantageous, since they enable the heart to pump more efficiently and at a slower rate. If a person later stops vigorous activity, the chamber dilation disappears, but the muscle hypertrophy remains. It should not be considered pathologic.<sup>9</sup>

The enlarged heart syndrome can best be illustrated by a comparison of somatotypes. The 1972 women's world record holder for the mile happened to be a wisp of a woman weighing only ninety-seven pounds. Proportionately, her heart was twice the size of those of the two biggest discus throwers engaged in olympic competition. Each man weighed just under 300 pounds and was actively engaged in trace and field events.<sup>10</sup>

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<sup>8</sup>Henry J. Montoye, "Today's Rigorous Training of Young Athletes," Medical World News, April 13, 1973, p. 53.

<sup>9</sup>Allan J. Ryan, "Today's Rigorous Training of Young Athletes," Medical World News, April 13, 1973, p. 54.

<sup>10</sup>Ernst Jokl, "Exercise and the Heart," The Consultant, July, 1972, p. 46.

Unexpected fatal collapses during exercise do happen, but rarely. In people with normal hearts, strenuous exercise does not cause death.<sup>11</sup> Since fatal collapse during exercise is caused by preexisting heart disease, the question arises whether these diseases can be detected in time. The answer is "yes." A competently conducted examination can detect most people whose lives are endangered because of heart disease.<sup>12</sup>

Orthopaedic examination. The orthopaedic examination occupies a prominent position in the series of examinations. It is critical to the assurance that an athlete is structurally sound. The stresses exerted upon the human body in the course of athletic competition demand excellence in anatomical function and maneuverability. Much of the orthopaedic examination can be accomplished by having the examinee display himself, unclothed, to the physician. Observation of symmetry of appendages and mechanics of gait can indicate structural pathology.

Eye examination. The eye examination employs little sophisticated equipment. The athlete should be checked for depth perception and the need for corrective lenses. A good eye examination should take a minimum of ten minutes. Furthermore, the pathology presented by the student-athlete,

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<sup>11</sup>Ibid., p. 48.

<sup>12</sup>Ibid.

once diagnosed properly through the routine physical, may serve to save him a lifelong fight with improper vision or no vision.

Neurological evaluation. The neurological examination is generally confined to testing reflex action. The testing is initiated using a small triangular rubber hammer. The examiner gently strikes the hammer on the various reflex points in the appendages. A positive movement indicates the nerve fibers are intact; proper sensory reactions can be expected from athletes who display the reaction capability. A more involved series of tests can be given, but they represent additional and unusual sophistication not often associated with annual physical evaluation procedures.

The data indicated that a portion of the above-mentioned nine subjects are being observed by the high school physician. However, there seems to be a lack of appreciation for the medical concerns of the athlete. There were only three subjects in which 50 percent or more of the total population received that medical consideration:

(1) blood pressure, 67 percent of population; (2) general physical condition, 73 percent; and (3) cardiological evaluation, 51 percent. The remainder of the subjects fell into descending population averages of: personal medical history, 42 percent; family medical history, 34 percent; eye examination, 32 percent; orthopaedic examination, 31 percent; neurological evaluation, 15 percent; and emotional stability

(psychological) evaluation, 10 percent. The data represented a reasonably low standard of physical examination for the cross-section of the high school athletic programs.

#### Question 8

Is the team physician a state-licensed allopathic or osteopathic physician?

Table 4.8.--Comparison of medical coverage in Michigan high schools by allopathic and osteopathic physicians.

	Class A	Class B	Class C	Class D
Allopath (M.D.)	43%	48%	36%	35%
Osteopath (D.O.)	32%	34%	28%	17%

The osteopathic profession has made significant inroads in the care of the population in rural and sparsely settled areas of Michigan. At the beginning of 1974, there were over 2,200 licensed osteopathic physicians in Michigan.<sup>13</sup> However, no substantial documents illustrate the ratio between allopath and osteopath, regarding the care of high school athletes. The survey included this question to obtain a representation of the care for athletes by profession.

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<sup>13</sup>Robert C. Ward, Chairman, Department of Family Medicine, Michigan State University, in discussion, January, 1974.



Question 9

Does your high school have a certified trainer?

Table 4.9.--Distribution of athletic trainers in Michigan high schools.

	Class A	Class B	Class C	Class D
Yes	18%	6%	8%	6%
No	80%	92%	88%	86%

The questionnaire did not explain what the term "certified" meant in this case. In most athletic circles, the certified athletic trainer is a member of the National Athletic Trainers Association. The certification process is long and thorough, and certification by the National Athletic Trainers Association is granted by that organization only after proper education and testing requirements and internships have satisfactorily been completed. To the respondent, however, the term certified could have meant a number of credentialing processes. One commonly accepted credential for training skills is the bachelor's degree from an accredited institution, with an emphasis on education in physical education.

Question 10

What is the academic or association credential of the trainer of the varsity sports?

Table 4.10.--Qualifying training for high school athletic trainers.

	Class A	Class B	Class C	Class D
Student, trained by a physician	2%	--	2%	2%
Student, trained by coach	25%	18%	26%	23%
Student, trained by outside trainer	9%	2%	10%	2%
Faculty, trained by physician	5%	3%	--	--
Faculty, trained by coach	4%	5%	6%	4%
Faculty, trained by outside trainer	7%	2%	--	2%
Faculty, physical education major	23%	19%	16%	17%
Faculty, physical education minor	--	3%	4%	8%
Licensed physical therapist	--	--	--	--
N.A.T.A. certified trainer	4%	--	4%	--
Chiropractor	5%	8%	2%	--

The eleven categories of athletic trainers cover the majority of possible sources for a high school trainer. The student trained by the coach relies upon the skills learned by the coach and his ability to teach these skills to the student. Clearly, there is a mandate among the high school coaches, stating that each team should have the services of

an individual whose main consideration is the care of the athlete.<sup>14</sup> This is meant to be a category of care that is nonphysician in nature.

The categories of student and faculty member who are trained by either a physician or another trainer from outside the school may reflect their potential for involvement. The physician and the trainer, who may be a clinical physical therapist, evidently are either in short supply or do not have the interest or the time to be involved with the high school athletic program.

The data also indicated that the four classes did not have sufficient trainers to contend with the day-to-day necessities of associate medical support for the athletic program. The tally in Class A revealed that 83 percent of the schools had trainers of all descriptions. Class B had 60 percent, class C 70 percent, and class D 58 percent. This would initially indicate that those schools without athletic trainers are taking the coach from his main responsibility of coaching and, by default, requiring him to perform the functions of the athletic trainer. Either case would deprive the student-athlete of the benefits to which he is entitled--proper care and proper coaching. One individual cannot adequately perform both functions.

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<sup>14</sup>Allen W. Bush, Director, Michigan High School Athletic Association, in discussion, September, 1973.

Question 11.a

Does your community have access to a hospital for all medical contingencies?

Table 4.11.--Distances from athletic contest areas to nearest hospital with emergency treatment capability.

	Class A	Class B	Class C	Class D
One to three miles from school	64%	48%	30%	13%
Four to six miles from school	29%	16%	20%	6%
Seven to ten miles from school	5%	11%	18%	31%
Eleven to twenty miles from school	2%	21%	26%	29%
Twenty-one or more miles from school	--	4%	6%	19%

Note: Affirmative answers are indicated.

The distances indicated in the responses to this question bring to focus the problem of treatment of the injured athlete. The necessity for trained personnel to be in attendance at an athletic contest is magnified by the acknowledged lack of available secondary medical assistance in many areas of the state. It is a staggering thought to place the immediate emergency care of an injured athlete solely upon the team coach when the nearest emergency treatment for that injured athlete is more than twenty-one miles

away. Yet 19 percent of the class D schools are faced with that ominous proposition.

Question 11.b

Does your community have access to a physical therapist for athletic rehabilitation within the community or the county?

Table 4.12.--Accessibility to physical therapist by Michigan high schools.

	Class A	Class B	Class C	Class D
Yes	77%	66%	44%	40%
No	20%	31%	50%	52%

This part of question eleven was intended to show some correlation between the availability of physical therapists and the part of question ten that asked if the high school trainers were physical therapists or if physical therapists were training students or faculty in the skills and responsibilities of that position.

A future study of the distribution of physical therapists in Michigan may gain some insight from these data. There have been some strenuous objections to the programs of training in physical therapy, the levels of education in physical therapy, and the evidenced inability to keep

graduates of the physical therapy curriculums in Michigan after graduation.<sup>15</sup>

### Question 12

Do student-athletes have a preseason physical conditioning program administered by a trainer or member of the physical education staff, in the following sports?

Table 4.13.--Preseason physical conditioning programs in Michigan high schools.<sup>a</sup>

		Class A	Class B	Class C	Class D
Football	yes	96%	89%	90%	88%
	no	2%	6%	6%	12%
Soccer	yes	11%	3%	2%	2%
	no	4%	10%	10%	21%
Baseball	yes	73%	43%	38%	44%
	no	5%	13%	18%	29%
Basketball	yes	89%	76%	66%	75%
	no	2%	9%	14%	17%
Hockey	yes	30%	3%	2%	2%
	no	6%	10%	14%	19%
Track	yes	84%	68%	62%	65%
	no	4%	5%	10%	18%
Wrestling	yes	73%	55%	30%	6%
	no	4%	11%	10%	22%
Swimming	yes	68%	13%	2%	23%
	no	3%	11%	14%	2%
Cross-country	yes	80%	58%	42%	15%
	no	2%	11%	10%	20%
Gymnastics	yes	16%	8%	4%	2%
	no	5%	4%	2%	8%

<sup>a</sup>Lacrosse was deleted because of a lack of response. The survey included the sport of lacrosse because it was thought lacrosse had greater popularity than was the case. Lacrosse will not be reported on in the following questions.

<sup>15</sup>John A. Doherty, Executive Director, Michigan Health Council, East Lansing, Michigan, in discussion, October, 1973.

The various sports listed in this question are played throughout the state of Michigan. The smaller high schools inherently display fewer sports and the larger high schools, with the greater numbers of participants, support additional sports.

Preseason physical conditioning programs have met with mixed reactions in the high schools.<sup>16</sup> Proponents of the programs claim the regimen of physical activity keeps the athlete in good physical condition in the off season. Additionally, the exercises aid in proper physical development in the growing years. The interest shown by a member of the coaching staff, faculty, or a trainer sometimes gives incentive to the athlete to adhere to a training schedule that ultimately will help in his chosen sport.

Opponents of the preseason training program say it is too much like semi-professionalism and that it inhibits development in other areas of athletics, scholarship, social, civic, and family interests. The time spent in the training program could be spent more profitably elsewhere. Opponents of the preseason physical training programs feel the program is illustrative of over emphasis on high school athletics.

The popular sports of football, basketball, and track had the highest reported participation in preseasonal

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<sup>16</sup> Robert James, Secretary-Treasurer, Michigan High School Coaches Association--1973, in discussion, September, 1973.

training. A future question may well be designed to obtain a reason for the lack of preseason physical conditioning in the class D high schools. The difference between class A (73 percent) and class D (6 percent) in wrestling would draw an inquiry about the philosophical difference between the two classes regarding preseason conditioning. Wrestling is an inexpensive sport to support. It also demands superlative physical conditioning.

### Question 13

Does your high school possess and utilize either or both of the following:

Table 4.14.--Possession and utilization of therapy equipment.

	Class A	Class B	Class C	Class D
Hydrotherapy equipment	64%	68%	58%	50%
Electrotherapy equipment	9%	15%	2%	4%

Note: Affirmative answers are indicated.

This question was asked to gain an indication of how much therapy equipment was in use in the high schools. Hydrotherapy has been in use for many years and requires a minimal amount of mechanical skill to operate the various hydrotherapy modalities. The electrotherapy modalities, however, can be dangerous if not operated properly. They



utilize electric current, usually converted to either sound waves or dry heat. Improper execution of the therapeutic treatment can result in serious, or sometimes fatal, consequences.

#### Question 14

Is there a nurse position in your high school?

If yes, is the nurse available for treating athletic injuries?

Table 4.15.--Nursing positions and their involvement with athletic injury.

	Class A	Class B	Class C	Class D
<u>Does position exist?</u>				
Yes	55%	48%	40%	13%
No	45%	50%	58%	85%
<u>Is nurse available for treating athletic injuries?</u>				
Intramurals, during the school day only	20%	21%	12%	4%
All sports up to 5 p.m.	7%	6%	2%	6%
No contact with athletic injury	34%	20%	28%	5%

The availability of nursing care for the high schools in Michigan is nonstandardized. Some communities have a school nurse who sees to the general health care of the

total school system (K-12). Other communities have a "community nurse" to make general calls on the high school, junior high school, and grade schools. In addition, the community nurse acts in a public health nurse role. The general health concerns of the community are her primary responsibility. She may make house calls on the sick, the elderly, and the infirm. The county nurse is delegated the same role, only on a much larger scale. Some communities and counties have no nursing capabilities at all. The data showed that 2 percent of all athletic injuries may be seen by a publicly supported nurse, and to receive attention the injury has to happen before five p.m.

#### Question 15

Is an injured student cared for by the family physician, the school physician, or both?

Table 4.16.--Care of injured athlete by either family or school physician.

	Class A	Class B	Class C	Class D
Family physician	70%	77%	88%	90%
School physician	4%	8%	2%	2%
Both	21%	12%	8%	8%

These data serve to illustrate further the relationship between the athlete, the school, and the attending physician. It may well be that the school physician and

the family physician are the same person. This variable may be found all across the state, but it does show that the association with the school by any physician is minimal. The question could have better stated the time in the sequence of treatment of the athlete that involved either the school physician or the family physician.

#### Question 16

Does your high school have any of the following emergency equipment available for athletic injuries (within a three- to five-minute time frame)?

Table 4.17.--Availability of emergency equipment at athletic contests and practices.

		Class A	Class B	Class C	Class D
Quick access to telephone and physician/hospital telephone numbers	yes	98%	94%	92%	94%
	no	2%	2%	4%	6%
Stretcher and bindings	yes	98%	94%	90%	92%
	no	2%	3%	6%	8%
Blankets	yes	98%	89%	76%	90%
	no	2%	8%	18%	10%
Bandages	yes	89%	98%	90%	98%
	no	--	--	4%	2%
Pharmaceuticals (for cuts and abrasions, etc.)	yes	89%	97%	88%	95%
	no	11%	--	2%	5%
Motor vehicle for transportation	yes	82%	91%	80%	81%
	no	13%	15%	14%	13%
First-aid-trained individual to handle emergency	yes	91%	77%	82%	85%
	no	4%	16%	14%	15%

These seven categories were considered to be mandatory items and capabilities that should be present at every interscholastic athletic contest.<sup>17</sup> Additional equipment should also be present. A cardiovascular consideration should be given not only to the players, but to the spectators. An ambulance with resuscitation equipment should be in the area near the contest, but not in plain view of the spectators and the players. The ambulance would contain all of the equipment available. Other transportation could be used to transfer cases of non-life-threatening injury.

#### Question 17

Can you document athletic injuries through your existing system?

Table 4.18.--Documentation of athletic injury through existing records in Michigan high schools.

	Class A	Class B	Class C	Class D
Yes	71%	66%	66%	63%
No	25%	26%	32%	31%

One concern with this question has been brought to light by medical research. When confronting any demographic medical problem, there has to be a common denominator plateau

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<sup>17</sup>James G. Garrick, "Sideline Decisions: A Practical Approach to Clinical Recognition and Immediate Management of Injuries in Athletes" (paper delivered to the American College of Sports Medicine, Knoxville, Tennessee, May 9, 1974).

of reference. If a researcher attempted to study the football injury rate for fifteen-year-old males during November, he would have great difficulty collecting the data. The lack of standardization gives license to each high school to record and transmit the event in its own way. This leads to difficulty and the mechanics of survey organization suffer accordingly.

The question was asked primarily to identify how many high schools kept any records of injury. Question thirty-four restates the question, but from a different approach. The composite answers to the two questions give some insight to the amount of record keeping of athletic injury that is presently practiced by the high schools.

#### Question 18

Does your football team practice on game fields?

Table 4.19.--Percentages of high schools using game fields for daily football practice.

	Class A	Class B	Class C	Class D
Yes	71%	18%	30%	42%
No	29%	76%	66%	43%

#### Question 19

Is your practice field in the same condition as your game field?

Table 4.20.--Percentages of high schools that evaluate their game field to be in the same condition as the practice fields.

	Class A	Class B	Class C	Class D
Yes	21%	18%	32%	33%
No	75%	74%	66%	42%

Questions 18 and 19 have no practicality because there is no basis for comparison. The survey did not ask the condition of the game field. The initial consideration was to gain some insight about where the coach held practices. Research has shown that ankle injuries happen on practice fields more than they do on game fields.<sup>18</sup>

Question 20.a

Do you play football games at night (under lights) or in the daytime?

Table 4.21.--Percentages of football games played at night and in the daytime.

	Class A	Class B	Class C	Class D
Night	64%	77%	86%	58%
Day	23%	6%	2%	13%
Both	11%	9%	10%	14%

<sup>18</sup>John W. Adkison et al., "Injury Rates."

Nighttime football in Michigan is a tradition dating back to post-World War II days. In the agricultural areas of the state, football was played at night so the weekend would be free for the high school boys to tend to their chores within the community and at home. In more densely populated areas, the games were played at night for the benefit of the spectators. To play a game on Saturday would conflict with the local college team, which had the better calibre of football for the spectator.

Today, not too many college teams play the quality of football that would take spectators away from high school games. In the Detroit area no major colleges play football, yet all of the city and suburban leagues play on Friday nights. The exception to this is the Catholic league, which plays some games on Sunday afternoons.

The prevalence of nighttime football led the investigator to question the safety aspects of playing football on Friday nights. Michigan has an average temperature of forty degrees in the evening in the months of October and November, much of it in concert with inclement weather. Snow, rain, and sleet are not uncommon during the latter part of football season. The turf upon which the game is played suffers accordingly. A freeze, followed by a thaw and then another freeze, compounded by precipitation, results in a treacherous playing surface.

Artificial lighting, much of it borderline candle-power, creates visual problems for the participants. The artificial atmosphere contributes to hesitancy and confusion in the actions of some football players. Their inability to adjust vision to accommodate the swift movements of the game is tested many times during the course of a game. At various times during the game, the visual acuity of a player becomes impaired because of an inability to adapt to the inconsistent illumination of the field. Ground-level action can be tolerated by most players quite easily. The most obvious difficulty is when a player is the receiver of a thrown or kicked football.<sup>19</sup> The various light spectrums that confront the player attempting to catch a football are greatly different than natural light.

The final concern with night football is the player's ability to display mental and physical reactions that can accommodate the fast pace and contact of football. A game played on a Friday night begins after the student-athlete has been awake for a period averaging between thirteen and fifteen hours. Very little of that time has been spent resting. The pace of a school day and the inherent anxieties of the event do little to prepare an athlete for a football contest. He must adapt to fatigue, climate,

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<sup>19</sup>Charles McCallum, Football Referee, Mid-American Football Conference and National Collegiate Athletic Association tournament football official, in discussion, September, 1973.



atmosphere, topography, lighting, and the pressures of the game.

The survey showed that only 11 percent of the respondents played their games in daylight. The majority of this percentage were from the Upper Peninsula, where, because of the cold weather, the high school football season ends two weeks before it does in the Lower Peninsula.<sup>20</sup>

Question 20.b

Do you practice under the lights?

Table 4.22.--Percentages of high schools that practice football under artificial lighting.

	Class A	Class B	Class C	Class D
Yes	16%	29%	28%	27%
No	80%	63%	66%	60%

The question was asked to identify what percentages of the high schools allowed their players the advantage of acclimatization to the artificial lighting. In fairness to the player, the coaching staff must provide him the opportunity to adjust to the lighting, the field surface, and the temperature difference.

<sup>20</sup>Michigan High School Athletic Association, Bulletin, Directory Issue, p. 304.

Question 21

Do you play football games on either Friday or Saturday?

Table 4.23.--Percentages of football games played on Friday, Saturday, and Sunday.

	Class A	Class B	Class C	Class D
Friday	61%	71%	72%	48%
Saturday	5%	3%	6%	15%
Sunday	4%	5%	2%	2%
Friday or Saturday	27%	13%	18%	22%

The Sunday and Friday or Saturday responses were written on the response sheet by the respondents. The Sunday percentages probably represented the Catholic high schools, which do play afternoon Sunday games. The replies that fell in the Friday or Saturday category diluted any assumption that the percentages in the Friday category were representative of the high school population. Any assumptions would need further clarification of how many games were actually played on Fridays and Saturdays.

Question 22

Is your track composition sand and clay, cinder, or artificial surface?

Table 4.24.--Organic or chemical composition of high school track.

	Class A	Class B	Class C	Class D
Sand and clay	5%	10%	12%	15%
Cinder	41%	55%	34%	23%
Artificial surface	48%	27%	28%	4%

The introduction of artificial surfaces to the sporting event of track was beneficial to the athlete in several respects. The artificial surface is resilient, and has a cushioning effect on the runner's feet, ankles, and legs. With the cushion effect also have come better running times in each event. The artificial track gives a superlative thrust, in addition to the improved physical capability of the athlete. The artificial surface is easy to maintain. Varying temperatures have little effect upon the composition of the track. Foul weather may make the track a bit slick, but it remains manageable for the runner. Fewer falls are incurred, and when the athlete does fall to the surface there is less opportunity for abrasion to the intergumentary structure.<sup>21</sup> Consequently, there is a better potential for keeping the athlete in competition when the general absence of injury and infection is noted. Of the population replying

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<sup>21</sup>Jerry Kimbrough, Athletic Trainer, Varsity Track Team, Michigan State University, in discussion, December, 1973.

to the questionnaire, only 77 percent acknowledge that their high schools had a track; of those schools, 28 percent had artificial surfaces on their tracks.

### Question 23

Do you play basketball on artificial surface or wood?

Table 4.25.--Composition of basketball courts in Michigan high schools.

	Class A	Class B	Class C	Class D
Artificial surface	9%	2%	8%	13%
Wood	89%	95%	90%	83%

This question was asked to establish some understanding of what percentages of high schools had the artificial surface on their basketball courts. The artificial surface basketball court has the same benefits for the basketball player as does the artificial track for the track athlete. The artificial basketball court has a smoother finished surface and the same cushioning effect. As a result the basketball is somewhat livelier, but players accustom themselves to the difference quite easily.<sup>22</sup>

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<sup>22</sup>Gus Ganakas, Head Basketball Coach, Michigan State University, in discussion, October, 1972.

Question 24

In the case of legal process for alleged medical malpractice, who becomes the defendant in a suit by a player or a family of a player that seeks damages?

Table 4.26.--Concept of legal liability by high school administrators.

	Class A	Class B	Class C	Class D
The school physician	21%	13%	20%	8%
The school	39%	35%	32%	48%
Legal process waived by parental permission	14%	10%	6%	4%

The responses to this question indicated that apparently there is no clear-cut procedure to satisfy claims of alleged medical malpractice in the case of the high school athlete. Bush stated that in cases where medical malpractice is an issue, the claimant has historically filed suit with all parties concerned, i.e., the coach, the attending physician, the school, and any other party to the occurrence.<sup>23</sup> The lack of clearly defined lines of responsibility necessitates this "shotgun" approach to satisfaction upon the part of the claimant. It would be a valid project for the future to resolve the apparent hiatus in the legal procedure for medical-legal claims.

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<sup>23</sup>Allen W. Bush, Director, Michigan High School Athletic Association, in discussion, July, 1974.

The third category, parental permission by waiver, was not initially part of the question. The original question asked, "Is the legal process waived by any means? If yes, by what legal vehicle?" The write-in replies were all addressed to the waiver response. The waiver form of releasing responsibility for an act or acts of medical practice has not been accorded a valid reception by the courts in Michigan.<sup>24</sup> The courts have ruled an individual may sign a writ of release that would seemingly discharge a physician from responsibility for acts of medical practice upon that person or a minor dependent, but the Michigan courts have ruled this is a breach of licensure and that the obligation for competent medical practice is incumbent upon the practicing physician.<sup>25</sup>

#### Question 25

Does your high school have a valid informed consent acknowledgment agreement between the school and the student-athlete (parents or guardian if in minority status) that explains the schedule of treatment in athletically incurred injuries?

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<sup>24</sup> Richard Lampman, Director, Cardiac Evaluation Unit, University of Michigan School of Medicine, Ann Arbor, Michigan, in discussion, June, 1974.

<sup>25</sup> Ibid.

Table 4.27.--Utilization of informed consent form in Michigan high schools.

	Class A	Class B	Class C	Class D
Yes	59%	44%	46%	40%
No	38%	51%	50%	52%

The informed consent form is not a waiver in the sense of the one referred to in question twenty-four. The informed consent form is permission, given by a parent or guardian, allowing that son or daughter, who is of minority age, to compete in interscholastic athletic competition. Once a student athlete reaches the majority age of eighteen, he may sign the consent form. The schedule of treatment is in reality the acknowledgment of the high school to the parent that a physician will be in attendance at interscholastic events. These events are specifically the sports in which the son or daughter is participating. There is no mandate to include a schedule of medical procedures, but the procedure could have a reassuring effect upon the parents of participants.

#### Question 26

Do your interscholastic athletic participants have a school-sponsored, off-season, weight training program? (By sponsored, it is meant the program is planned and monitored by a member of the physical education staff or faculty. If yes, circle the party responsible for monitoring of the program.)

Table 4.28.--Percentages of high schools utilizing off-season weight training programs.

	Class A	Class B	Class C	Class D
Yes	89%	74%	62%	42%
No	11%	23%	36%	58%

This question was a variation of the theme in question twelve. In that question the emphasis was on the pre-season training activity of the athlete. In this question the consideration was for the off-season training program. Off season may be interpreted to include the complete academic calendar year, less the time spent participating in a varsity seasonal sport. Weight training, properly administered, helps to prevent injuries by hardening the body and increasing resistance to fatigue.<sup>26</sup> Sixty-eight percent of the respondent population replied that they were sponsoring an off-season weight training program. This is an excellent indicator of intensive effort to maintain the physical well-being of the student-athlete.

#### Question 27

The President's Council on Physical Fitness, in a high school study of student-athletes by H. Harrison Clarke in the Physical Fitness Research Digest,

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<sup>26</sup>Safeguarding the Health of the Athlete, A joint statement of The Committee on the Medical Aspects of Sports of the American Medical Association and The National Federation of State High School Athletic Associations, 1965.



stated that there is a correlation between athletic excellence and academic and social success in the high school years. Do you believe that this statement could be valid in your high school?

Answer by one of the following measures.

Table 4.29.--Opinions on correlation of athletic achievement and social and academic success.

	Class A	Class B	Class C	Class D
The statement applies to the greater majority of athletes in this high school--over 80%.	21%	18%	22%	33%
The statement applies to the majority of athletes in this high school--51 to 80%.	52%	58%	54%	42%
The statement applies to many of the athletes in this high school--40 to 50%.	16%	13%	10%	15%
The statement applies to some of the athletes in this high school--20 to 39%.	7%	5%	12%	8%
The statement applies to a few of the athletes in this high school--1 to 19%.	2%	1%	--	2%

The object of this series of questions was to obtain a perspective of how the high school athlete was observed by the high school principal. The reference to the research by Clarke may have served to elevate the positions of athletic, academic, and social successes of each principal's

student-athlete population. The answers would give hope to the advocates of interscholastic sports. The discipline, responsibility, teamwork, and trust that each athlete must assume, personally, to achieve goals in athletics seem to be of great benefit in the maturing process.

#### Question 28

How would you rate your athletic department personnel and coaching staffs with regard to the number of physical educators and coaches per sport?

Table 4.30.--Ratings of manning levels in physical education departments and coaching staffs in Michigan high schools.

	Class A	Class B	Class C	Class D
Optimum levels of manning have been achieved	23%	21%	16%	17%
Adequate student-instructor, coaching ratios have been achieved	48%	45%	54%	48%
Instruction & coaching of sports are being covered by some faculty, employed outside their specialty. A doubling-up by faculty has guaranteed coverage of our athletic program.	20%	21%	26%	33%
Below-par manning levels have necessitated the curtailing of some athletic events and programs.	5%	10%	2%	--
Lack of sufficient personnel has led to cancellation of athletics.	4%	--	--	--

These answers indicated that approximately 4 percent of the respondent high schools were in jeopardy of curtailing athletic programs because of insufficient faculty or staff to adequately administer the program. The 4 percent in class A that indicated athletic programs had been cancelled because of lack of personnel should be investigated. In this regard, Bush stated he was not aware of any class A high school withdrawing from interscholastic competition.<sup>27</sup>

#### Question 29

Would you be in favor of a more centralized athletic medicine program of education, research, and service being inaugurated in this university or any other state university? This would necessitate standardized physical examinations, possible involvement of medical students in the medical administration of your program, possible retraining for the athletic staff in physical training and rehabilitation, and implementation of an athletic injury audit system.

The reception to this question was positive, in varying degrees, from 92 percent of the survey population (see Table 4.31). This reception was most favorable for progress in research and education in the field of athletic medicine. The response can be interpreted as a mandate from the high school principals to initiate a program of education, research, and support that will ultimately benefit their respective high schools.

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<sup>27</sup>Allen W. Bush, Director, Michigan High School Athletic Association, in discussion, July, 1974 (after the data for this question had been compiled and presented to the Association).

Table 4.31.--Opinions on athletic medicine program of education, research, and service originating at Michigan State University or other state-supported institution.

	Class A	Class B	Class C	Class D
Strongly oppose	2%	2%	2%	2%
Oppose	2%	1%	--	2%
Oppose, with some reservation	4%	3%	4%	6%
Favor, with some reservation	34%	35%	32%	33%
Favor	34%	21%	40%	31%
Strongly favor	25%	35%	22%	24%

#### Questions 30, 31, and 32

Preface: Appropriate medical coverage of interscholastic athletic contests has long been a subject of discussion among high school administrators. In the spaces below you are asked to reply with your preference, pro or con, to the three areas of medical coverage.

The percentages will be presented as composites of the four classes. Separate class data will be provided by the researcher upon request.

#### Question 30

The following list of sports should receive medical coverage by a qualified physician in every instance of interscholastic athletic competition.

Table 4.32.--Opinion of respondent to physician attendance  
at all high school athletic events.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Football	81%	16%	1%	--
Soccer	33%	25%	8%	--
Baseball	20%	35%	35%	1%
Hockey	50%	19%	2%	--
Swimming	17%	21%	31%	2%
Track	22%	30%	36%	3%
Wrestling	39%	30%	15%	2%
Cross-country	16%	29%	34%	6%
Gymnastics	27%	22%	18%	2%

The majority of the respondents agreed that a physician should be in attendance at every interscholastic event involving contact sports. The noncontact sports of baseball, swimming, track, cross-country, and gymnastics did not gain this type of support, but encouragingly there was no strong disagreement to a physician being in attendance at these events.

#### Question 31

The sports listed below should have in attendance at interscholastic sports events a medically qualified athletic trainer. (By qualified it is meant that the individual should be either Red Cross certified, or university or college credentialed as a

trainer, be a physical therapist, or be certified by the National Athletic Trainers Association.

Table 4.33.--Opinion of respondent to athletic trainer attendance at all high school athletic events.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Football	67%	27%	2%	--
Soccer	38%	29%	2%	--
Baseball	32%	36%	22%	--
Hockey	45%	24%	2%	--
Track	30%	40%	19%	--
Swimming	24%	30%	17%	1%
Wrestling	43%	37%	5%	--
Cross-country	25%	33%	25%	1%
Gymnastics	31%	29%	11%	--

This question removed the potential for having a student trainer endorsed by the principal. Each category of training was adaptable to the faculty member. It would take an exceptional student to master the Red Cross course in first aid. However, the exception to the rule must be acknowledged. Some teenagers have enrolled in Red Cross life-saving courses and passed them to gain membership in the National Ski Patrol.<sup>28</sup> Ambiguity is also illustrated in the

<sup>28</sup>Donald Lawson, Certifying Examiner, Mid-Michigan Chapter of the National Ski Patrol, in discussion, July, 1973.

option for a university- or college-trained athletic trainer. Such an option is extremely flexible, as there are no curriculums designed for a degree in athletic training. However, there are courses of instruction within the various physical education curriculums that teach the skills necessary to become certified as an athletic trainer by the National Athletic Trainers Association.<sup>29</sup>

### Question 32

Please state your opinion, pro or con, on the subject of new legislation in the Michigan High School Athletic Association regarding mandatory attendance (contracted) by a physician at an interscholastic athletic event. Which sports should have, without fail, proper medical (physician) coverage?

Table 4.34.--Opinion of respondent to the suggestion that physician attendance become a mandate of the Michigan High School Athletic Association.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Football	75%	14%	4%	2%
Soccer	26%	20%	15%	2%
Baseball	9%	20%	40%	9%
Hockey	42%	16%	8%	2%
Track	10%	17%	43%	8%
Swimming	8%	16%	32%	8%
Wrestling	28%	23%	23%	3%
Cross-country	7%	17%	41%	10%
Gymnastics	19%	17%	24%	5%

<sup>29</sup>Clinton B. Thompson, Certified Athletic Trainer and Head Athletic Trainer, Department of Intercollegiate Athletics, Michigan State University, in discussion, September, 1973.

This question had the same intent as question thirty, but it was worded as if it had a chance to become a dictate by the Michigan High School Athletic Association. Responses for every sport showed additional negative response to the proposition of mandatory attendance by a physician. The wording of the question may have erroneously indicated that the possibility of such a mandate was forthcoming from the Association. Such is not the case. There is no talk of instituting a rule on mandatory attendance by a physician.<sup>29</sup>

### Question 33

Do you believe in more stringent rules regarding the weight limitations of high school wrestlers? (This question is asked because of the inherent dangers of rapid weight loss to the growth and development of the young adult and the lingering cardiological implications of high percentages of weight loss and gain in wrestlers.)

Table 4.35.--Percentages of respondents who support more stringent rules regarding the weight loss and gain in high school wrestlers.

	Class A	Class B	Class C	Class D
Yes	80%	81%	66%	58%
No	14%	13%	26%	9%

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<sup>29</sup>Bush, op. cit.



Seventy-two percent of the survey population would support a rules change designed to help the high school wrestler avoid losing and gaining significant amounts of body weight. This problem has been with high school wrestling for many years and no satisfactory solution has yet been achieved. The support that the data indicated may serve to give impetus to a change in the existing rules on weight control in high school wrestling.

Question 34.a

Are medical records maintained by either the high school athletic physician or your office regarding athletic trauma? This pertains to the injured athlete by type of injury, treatment, medical payments, rehabilitation, and reinstatement of the athlete to active competition in athletics.

Table 4.36.--Percentage of high schools maintaining medical records on interscholastic athletic participants.

	Class A	Class B	Class C	Class D
Yes	45%	40%	36%	29%
No	52%	58%	58%	54%

Question 34.b

If yes, please check the appropriate record:

Table 4.37.--Percentages of high schools keeping medical history, annual physical evaluation, injury record, treatment and rehabilitation records.

	Class A	Class B	Class C	Class D
Medical history	20%	8%	10%	13%
Physical evaluation record (annual)	21%	18%	18%	19%
Injury diagnosis and treatment record	23%	13%	20%	8%
Rehabilitation record	4%	3%	4%	2%
Permission to participate clearance (by physician)	45%	40%	28%	19%

An attempt was made through this question to illustrate the involvement of the high school administration with the various stages of record keeping necessitated by injury to a high school athlete. The underlying question remains to offer some confusion to the issue: Does the high school have an obligation to maintain these records? Or is it an obligation of the high school to maintain the records as part of a commitment to their role in the administration of health care delivery to the student-athlete? Both questions have valid arguments. It might be necessary to establish positions of responsibility between the physician and the high school regarding the monitoring of the health care delivery to the injured athlete.

Question 35

Do you have any method of establishing the fact that a student-athlete is psychologically adaptable to the sport within which he is attempting to participate? If yes, select one of the following methods.

Table 4.38.--Percentages of high schools that utilize a form of psychological measurement with their athletes.

	Class A	Class B	Class C	Class D
Yes	14%	8%	8%	17%
No	86%	89%	90%	83%
<u>All Classes</u>				
Interview with coach		7.0%		
Interview with physician		3.0%		
Known medical history		.5%		
Parental consultation		2.0%		
Psychological testing service		.5%		
Interview and consultation with school		1.0%		

Each high school athlete has many reasons for being an athlete. There have been generalized acknowledgments that athletics are a challenge. It may be that a certain sport merits participation because it is popular among the student body and one's participation will increase his popularity accordingly. The student may view athletics as a

means to gain upward mobility. A good high school record may lead to a college scholarship and opportunity for the future. All of these assumptions are valid. In addition, in many cases the student is influenced by peer group or parental pressure, or an inflated ego. The growing concern for placing athletes in the sports in which they rightfully belong, based upon somatotype and motivation, is in the not-too-distant future. Mikles stated that student-athletes need to be regarded seriously for their physical and mental potential for a sport, and also the age at which they choose to enter competition.<sup>30</sup>

#### Question 36

Please identify the interscholastic sports your high school supports.

The answers to question thirty-six have been deleted from the data analysis. The variations of answers received from the respondents were extremely difficult to comprehend. Some respondents gave an accurate summation of their school sports by male/female and varsity and junior varsity. Others placed one with the other and created a mixture of levels of competition. The resulting matrix of sports and categories gave no indication of being an effective presentation.

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<sup>30</sup>Gale E. Mikles, The (Lansing, Michigan) State Journal, August 1, 1974, p. C-1.

Question 37

Is there a formal classroom session scheduled for the prospective athletic participants that is expressly designed for teaching the rules of the game and the necessity for mental awareness and physical conditioning in any of the following sports?

Table 4.39.--Percentages of high schools that have classroom instruction prior to season to discuss rules, discipline, and physical fitness.

	Class A	Class B	Class C	Class D
Football	50%	52%	44%	44%
Swimming	27%	15%	2%	4%
Soccer	7%	8%	6%	4%
Basketball	45%	48%	36%	48%
Hockey	14%	3%	6%	6%
Track	29%	39%	24%	31%
Cross-country	23%	21%	14%	13%
Gymnastics	16%	6%	2%	4%
Wrestling	30%	34%	24%	8%

Note: Affirmative answers are indicated.

The initial introduction of a sport or a new season to interscholastic athletes should be a primary consideration of the coaching staff. The necessity for a comprehensive understanding of the rules and the physical rigors of the game and the individual responsibilities for the conduct of the game should be firmly presented to the athletes.

As a result, the game will be played and administered better.

### Question 38

When considering the application for employment of a prospective physical education faculty member, do you select him for: (Please rank order 1, 2, 3, etc. the following categories from most important to least important in your estimation.)

Each category will be reported by the percentages of those chosen as number one consideration when hiring new faculty. The other nine categorical ratings will be supplied by the researcher upon request.

Table 4.40.--Educational and personality preferences by administrators in hiring new faculty.

	Class A	Class B	Class C	Class D
Coaching capability	5%	8%	10%	13%
Personality	14%	6%	8%	11%
Academic background; scientific minor	5%	3%	10%	13%
Physical education major	34%	32%	32%	19%
Experience	9%	8%	4%	6%
Expertise in sport	4%	3%	6%	4%
Institution attended (undergraduate)	2%	--	--	--
Years of coaching experience	5%	--	--	8%
Adaptability to program	39%	27%	30%	33%
Academic background	13%	3%	6%	17%

These data gave an insight into the qualifications that high school administrators look for in prospective candidates for a physical education position. The remaining categories of qualifying potential had much the same distribution of respondents' expressed likes and dislikes. There was no one solid choice in any level of ranking preferences.

Question 39.a

If you have a football player ingest his tongue in a practice scrimmage session, do you have a person present who can act appropriately in the situation?

Table 4.41.--Availability of medically trained person to contend with medical emergency.

	Class A	Class B	Class C	Class D
Yes	93%	84%	98%	77%
No	4%	8%	2%	15%

Question 39.b

If yes, who?

Table 4.42.--Identification of medically trained people to attend medical emergency.

	Class A	Class B	Class C	Class D
Physician	--	2%	2%	--
Coach	57%	68%	84%	70%
Trainer	27%	8%	6%	4%
First-aid-trained individual	11%	11%	6%	6%

The threat of a player being rendered unconscious and consequently losing the control of his tongue is ever-present in athletics. The tongue can obstruct the airways passage and become a threat to life within seconds, once an athlete becomes unconscious. The necessity for having an individual present who can restore the airways passage to a functional status is self-evident. The lack of physician attention strongly points out the need of proper emergency training for all faculty and students involved in the athletic program.

#### Question 40

Are your student-athletes fitted, without exception, to the equipment they will wear in practice and the actual games?



Table 4.43.--The fitting of athletic equipment to high school athletes.

	Class A	Class B	Class C	Class D
Yes	95%	87%	88%	83%
No	5%	10%	10%	13%

The necessity for proper fit of equipment is quite evident in the collision sports. A loosely fitting helmet affords the wearer no protection. Conversely, the helmet that fits too tightly affects the wearer from the moment he puts it on his head. Improperly fitting shoulder and thigh pads might slip and cause injury to the wearer. The edge of the shoulder pad can act as a cutting instrument. Facial damage is not uncommon when a player is struck by an exposed shoulder pad. The same considerations apply to ill-fitting shoes or sneakers, oversized or cumbersome clothing, and tight-fitting or motion-restricting clothing. Neck collars prevent spinal injuries only if they are fitted properly. The neck flexion potential is appreciably diminished if the collar is worn snugly between the helmet and the shoulder pads.

#### Question 41

Beyond the preseason conditioning days of practice, what are the time durations of a daily practice for football (outside)?

Table 4.44.--Outdoor practice times for football.

	Class A	Class B	Class C	Class D
One hour	--	2%	--	--
One and a half hours	13%	21%	26%	2%
One hour and forty-five minutes	20%	26%	36%	21%
Two hours	46%	35%	34%	25%
Two hours and fifteen minutes	11%	5%	--	35%
Two hours and thirty minutes	9%	2%	2%	5%
Two hours and forty-five minutes	--	1%	--	2%

There is a direct relationship among the length of practice, the ensuing fatigue factor, and the incidence of injury in athletics.<sup>31</sup> The longer an athlete stays out to practice, the more susceptible to injury he becomes. Reflex actions, respiration, and visual acuity all become impaired to a certain extent. The question was placed in the questionnaire to obtain some information on the duration of the average high school practice session.

#### Question 42

Does your football equipment list include:

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<sup>31</sup>Ryde, "The Role of the Physician," p. 152.

Table 4.45.--Football equipment utilization.

	Class A	Class B	Class C	Class D
Soccer-type cleats	77%	69%	76%	67%
Neck collars	86%	79%	78%	65%
Face guards	93%	92%	96%	85%
Dental protection-- mouth pieces	--	92%	98%	85%
Elbow and knee protection	93%	89%	96%	75%

Note: Affirmative answers are indicated.

The five items listed in Table 4.45 are becoming recognized as valuable football equipment. Face guards are compulsory equipment for players on both the high school and collegiate levels of competition. Dental protection was legislated into the rule books last year when the National Collegiate Athletic Association made their inclusion on the equipment list for football mandatory. Elbow and knee pads have been a part of the football uniform since before the days of the helmet being used as a protective device.

#### Question 43

Does your emergency trainer's bag have an airways passage device?

Table 4.46.--Percentages of high schools that possess the airways passage device.

	Class A	Class B	Class C	Class D
Yes	61%	37%	50%	31%
No	34%	56%	42%	48%

The airways passage device is a polyethylene tube that is constructed like the adult human throat. It measures approximately six inches long and costs, through a medical supplies wholesaler, about three dollars. It is an invaluable piece of equipment to the trainer, as those who have had occasion to use it will testify. The device helps keep the tongue in its proper position in the mouth. The device serves to keep the throat open and unobstructed, and also to provide a clear passage for breathing. The device is used in emergencies, and only until proper medical authority assumes treatment of the incapacitated individual.

#### Question 44

Which of the following are used on the ankles of your athletes? (See Table 4.47.)

The practice of taping ankles has questionable protective value. O'Donoghue, Ryan, and Ferguson<sup>32</sup> all questioned the use of tape as a primary protection of the ankle.

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<sup>32</sup>Supra, pp. 48-50.

Tape has become an expensive item for such questionable protection. Forty percent of the respondents indicated their athletic departments taped ankles for both practices and games. Only 4 percent indicated no support. A future research project may prove justified if the injury rates to ankles and knees in those respective high schools were known to a medical researcher.

Table 4.47.--Percentages of high schools that treat the ankles of high school athletes with tape or wrap.

	Class A	Class B	Class C	Class D
Tape, only for a game	7%	6%	10%	10%
Tape, practice and game	25%	45%	42%	48%
Tape or wrap for a game	14%	6%	6%	4%
No support	4%	3%	6%	4%
Tape or wrap when needed	39%	19%	26%	28%
Wrap, practice and game	--	10%	4%	4%
Wrap, game only	--	--	--	--

#### Question 45

What kinds of helmets are used for football?

Table 4.48.--Types of helmets utilized in football.

	Class A	Class B	Class C	Class D
Full padded lining, plastic shell	50%	52%	52%	44%
Suspension lining, plastic shell	54%	50%	50%	48%
Padded lining, padded shell	7%	3%	10%	2%
Suspension lining, padded shell	18%	6%	18%	8%
Water cell lining, plastic shell	2%	--	4%	--

Football helmets are a concern for more than the apparent impact considerations. The helmet's ability to expand and contract in extremes of heat and cold is necessary for player safety and comfort. Two considerations are: (1) that the plastic shell not become brittle in cold weather (as may be the case in the Michigan fall), and (2) that the suspension lining is in original condition either through upkeep and maintenance or through replacement. The ability to have a padded exterior to act as an insulation device and also have the padding inside the helmet for comfort and protection is a factor that makes the plastic shell, suspension-lined helmet a poorer risk than the other alternatives. The helmet with a padded shell and padded lining has a drawback in warmer climates. The ambient air temperatures are usually one to one-and-one-half degrees F. higher than the outside

air temperature.<sup>33</sup> This phenomenon could cause great discomfort and disorientation to the wearer after a period of time. It could also contribute to dehydration, which would further compound the potential harm to the athlete.

#### Question 46

Are your football goal line markers the foam rubber fill, vinyl covered, spring type?

Table 4.49.--Percentages of high schools that use foam rubber goal line markers in football.

	Class A	Class B	Class C	Class D
Yes	79%	66%	64%	56%
No	14%	21%	30%	29%

This question was asked to identify what percentage of the survey population was using the safety goal line markers. Players will, upon occasion, fall across the goal line markers. Flags, metal markers, and poles have all been used in high school football to mark boundaries, including the goal line. If another survey were taken in the future and this question asked again, it would be encouraging to see the 23 percent who did not have the safety markers become a zero.

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<sup>33</sup>A. Eugene Coleman and Amr K. Mortagy, "Ambient Head Temperature and Football Helmet Design," Medicine and Science in Sports 5 (Fall 1973): 204-208.

Question 47

What source do you utilize in updating athletic training or physical conditioning practices?

Table 4.50.--Methods of updating athletic training or physical conditioning practices.

	Class A	Class B	Class C	Class D
The team physician	43%	29%	28%	15%
A physical therapist	2%	3%	4%	4%
Coach's decisions (empirical)	64%	58%	64%	63%
Medical journals	27%	11%	14%	21%
Athletic periodicals	63%	48%	68%	54%
Other (clinics)	11%	11%	4%	4%

Once again the data illustrated the dependency upon the coach to supply the necessary knowledge to keep the physical training abreast of current changes in physical education. The physician is also a factor in this evolution. If the physician does not make a point of keeping in touch with the practice of athletic medicine, his contribution will be somewhat less than desired. Athletic periodicals are an ambiguous option. The overriding concern with this question is that the data may have indicated the coaches' support of "folklore" medicine and practices in physical education.



Question 48

Which of the following changes in football rules would you endorse for the purpose of reducing injury?

Table 4.51.--Opinions of the respondents to proposed rules changes in football for the intended purpose of athletic safety.

	Class A	Class B	Class C	Class D
Kick-off only after touchdown (field goal would give opponent the ball on their own twenty yard line).	18%	11%	16%	8%
More leeway for officials to call unnecessary roughness on tackling plays.	52%	42%	36%	31%
Ejection from a game for a second face mask violation by a defender.	25%	26%	30%	17%
A five yard "free zone" for the player fielding a punt, nullified after contact with the ball.	27%	16%	26%	17%
Neck collar become mandatory equipment (except for the quarterback).	18%	16%	22%	25%
Any player taken out of a game a second time for the same injury cannot return to the contest.	63%	58%	46%	48%

These questions were submitted to the respondents in the fall of 1973. Variations of the first and fourth changes have now been adopted by the new World Football League. The respondents did not think too highly of the suggestions in

options one and four. The leeway issue for officials is ambiguous. Good officials will officiate well; that includes roughness calls on tackling plays. Poor officials will hesitate to call a close play. The face mask violation has been a subject of discussion at all levels of football officiating.<sup>34</sup> In question forty-two, 77 percent of the respondents stated they supplied neck collars to their football players, yet in this question only 20 percent wanted to see mandatory use of the neck collar introduced into the equipment rules. The injury question has always been at the discretion of the attending physician, but it is evident that a sizable number of high schools do not have physicians in attendance. This may be just cause to open the subject of mandatory removal of an athlete from a contest for repetitious injury, especially head and neck injuries.

#### Questions 49 and 50

These questions solicited open-ended answers from the respondents. The respondents usually gave short replies on various subjects. All of the replies to questions forty-nine and fifty are included in Appendix D.

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<sup>34</sup>McCallum, in discussion.

## CHAPTER V

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Chapter V is devoted to a summary of the study, followed by a discussion of the findings generated from the data, and concluded with recommendations and implications and implications for further research.

#### Summary

##### Purpose of the Study

The basic purpose of the study was to assess the health care capabilities for interscholastic athletes in Michigan senior high schools. Health care capabilities were identified through the use of a questionnaire that solicited responses regarding health care practices. The questionnaire contained six categories of concern having a direct bearing on the medical welfare of the high school athlete: (1) the physical examination, (2) athletic physical training, (3) athletic equipment, (4) athletic medical education, (5) records of athletic trauma and rehabilitation, and (6) athletic medical-legal aspects.

### Limitations and Scope of the Study

The limitations of the study were as follows:

1. The study dealt only with senior high schools in Michigan.
2. The study was concerned only with the medically related practices that are programmed for and executed by the interscholastic athlete in all interscholastic sports.
3. The design of the study did not provide for comparing the findings of one school and another or of one class of school with other classes.

### Methodology

A survey was conducted by means of a mailed questionnaire containing fifty questions, of which forty-eight were of the closed-response variety. The two remaining questions solicited opinions on possible rule changes in high-school-level football. The respondent was the principal officer of the high school. Two hundred and eighty high schools were randomly selected from the membership of the Michigan High School Athletic Association. Seventy schools from each of the four classes--A, B, C, and D--comprised the random sample from the total membership of 709 schools. Seventy-seven percent of the 280 high schools solicited responded to the survey. This number represented 31 percent of the total Association membership of 709 high schools.

## Findings

Category One: Physical Examination.--The findings in this category indicated that:

1. The majority of the high schools (72 percent) in the survey indicated they did not have a regular physician.

2. The majority of the high schools did not have a continuing relationship with the same physician. This is an indicator of the varying consistency of health care delivery to the athlete. Only 39 percent indicated they did have sustained care by the same physician.

3. The physical examination of the student, represented by the nine medical subjects included in the question, was generally not of the standard thought to exist prior to the survey. The subjects and their percentage of inclusion in the physical examination were (represented as a composite of all classes):

Blood pressure . . . . .	.67%
Family medical history . . . . .	.34%
General physical condition . . . . .	.73%
Personal medical history . . . . .	.42%
Emotional stability. . . . .	.10%
Cardiology evaluation. . . . .	.51%
Orthopaedic evaluation . . . . .	.31%
Eye examination. . . . .	.32%
Neurologic evaluation. . . . .	.15%

4. There was considerable evidence to indicate a basic misunderstanding exists pertaining to adequacy of health care for athletes. Adequacy indicates that there is sufficiency for a specified requirement. The prime contradiction in the respondents' answers was illustrated by the

fact that the majority indicated they believed the physical examination given their student-athletes was "adequate," and yet the responses to the nine aforementioned medical categories contradicted that belief.

5. Physician attendance at interscholastic athletic contests is not required by the Michigan High School Athletic Association. The varying percentages of physician attendance for each of the four classes indicate the necessity for concern regarding the treatment of injured athletes during an interscholastic athletic event.

6. The emergency care is predicated on the presence of either a physician or appropriately trained personnel. The lack of physician attendance at games indicates a heavy reliance upon the local hospitals. The distances from field to hospital and emergency care capabilities are depicted in the following figures:

Hospital within 1-3 miles. . . .	.40% of survey
Hospital within 4-6 miles. . . .	.18% of survey
Hospital within 7-10 miles . . . .	.16% of survey
Hospital within 11-20 miles. . . .	.14% of survey
Hospital farther than 20 miles . . .	7% of survey

Category Two: Athletic Physical Training.--The findings in this category indicated that:

1. The survey did not determine the level of medical knowledge or awareness of certain types of athletic injury possessed by the high school coaches. No question was included that would have yielded that information.

2. The respondents indicated only 2 percent of the trainers attending high school athletes were certified by the National Athletic Trainers Association.

3. The ability to treat an athlete who has had his tongue block the airways passage depended on the skills and ability of the coach in 61 percent of the respondent high schools. Eleven percent depended upon a trainer and 9 percent relied upon a first-aid-trained individual. Less than 1 percent had quick access to a physician and 18 percent of the respondents acknowledged they had no trained individual to take appropriate life-saving measures with a potential asphyxiation case.

The nursing position in the high school setting was identified as being available to treat athletic injuries in 2 percent of the sample population. Few injuries incurred after 5 p.m. received care from the nurse; only 2 percent of the nurses were available after 5 p.m.

4. The airways passage device (a device that aids in clearing the oral cavity of obstructions and also contains an airways corridor) was possessed by 45 percent of the respondent high schools.

5. Percentages of respondent high schools supporting preseason physical conditioning programs were as follows:

Football . . .	.88%
Soccer . . .	. 5%
Baseball . . .	.50%
Basketball . .	.77%
Hockey . . .	.10%
Track. . .	.70%
Wrestling. . .	.43%
Swimming . . .	.22%
Cross-country.	.51%
Gymnastics . .	. 8%

6. Sixty-eight percent of the high schools in the survey practiced off-season weight training programs.

Category Three: Athletic Equipment.--The findings in this category indicated that:

1. Eighty-eight percent of the respondents stated they issued properly fitting equipment to their athletes.

2. Twenty-eight percent of the respondents had artificial surfaces on their track areas.

3. Ninety percent of the respondents conducted their basketball games and practices on wood floors, while 7 percent used an artificial surface. The remaining 3 percent had no basketball court or did not support a basketball team.

Category Four: Athletic Medical Education.--The findings in this category indicated that:

1. High school athletic teams obtained new materials and information pertaining to medical and physical education from several sources. Such sources were:



The physician. . . . .	29% of the time
The coach. . . . .	62% of the time
A physical therapist . . .	3% of the time
Medical journals . . . .	18% of the time
Athletic periodicals . . .	58% of the time
Athletic clinics . . . .	8% of the time

There was evidence that some respondents used more than one method to keep abreast of changes in medicine and physical education. Again, the high school administration respondents exhibited great discrepancy about the real or imagined skills and education of the team coach. This is another illustration of the misconception that the coach has mastery of several physical education skills, including a substantial number of the physical sciences.

Category Five: Records of Athletic Trauma and Rehabilitation.--The findings in this category indicated that:

1. The survey instrument did not provide adequate information and direction to the respondent that would allow for response to what kind of nomenclature was being used to keep records on athletic trauma. Standardization of reporting injuries was virtually nonexistent. Thirty-eight percent of the reporting high schools indicated they kept medical records on injured athletes. These 38 percent (eighty-two high schools) maintained five separate records. They were (by percentage of each category):

Medical history. . . . .	.12%
Annual physical evaluation . .	.19%
Injury diagnosis . . . . .	.16%
Rehabilitation record. . . . .	3%
Permission (from physician) to participate . . . . .	.34%

The "permission to participate" document is usually retained by the high school as a matter of medical-legal importance. Any athlete who later reinjures the same anatomical member may seek redress in the form of a liability suit. In the case where the school has the "permission to participate" form in their possession, the defendant in any legal arbitration is usually the signing physician.

2. No audit system of athletic injuries was used by the high schools that responded to the survey.

Category Six: Athletic Medical-Legal Aspects.--The findings in this category indicated that:

1. Where there is clearly cause for legal redress in the case of a liability suit, the naming of a defendant of defendants becomes a subject of some confusion regarding who will be accused in the complaint. The apparent lack of clearly defined lines of responsibility for the safety of the athlete leads to multiple allegations against several parties. In the case of a liability suit regarding negligence resulting in physical injury to an athlete, 16 percent of the respondents stated the physician would become the defendant; 39 percent indicated the high school would be the responsible party; and 15 percent had the impression

that the legal process can be waived by a parental consent form. Bush stated that in many cases the claimant often named the coach, physician, and the school in the suit, with the intent that the court signify the liable party.<sup>1</sup>

### Conclusions and Recommendations

The health care of the Michigan high school inter-scholastic athlete is sporadic. Although changes in equipment, rules, or techniques of a sport manifested progress in the concern for the welfare of the student-athlete, direct changes in the delegation of proper health care to the athlete have been few. The paucity of health care for the high school athlete is evident in the data revealed by this study. The omissions and shortcomings in health care delivery to the high school athlete can be overcome by a concerted effort toward alleviating the conditions of health care delivery systems reported in this study.

The health of the individual student-athlete is, initially, the charge of those people who are close to him on a daily basis. Good or bad practices in the care of athletes could be recognized by the high school administrative officers, the community, or the parents of the athlete. Good health care is not always understood or appreciated by various segments of our society, and the status quo appears to be acceptable to many members of the community.

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<sup>1</sup>Allen W. Bush, in discussion, April, 1974.

State Associations'  
Responsibility and Involvement

Should the community have the awareness to identify poor health care practices, they can either attempt to rectify them on a local basis or seek a statewide referendum. The latter course of action would involve several associations and possibly the state legislature. It may well be that local efforts to improve conditions of health care for high school athletes have fallen short of their goal. Finances, availability of health care professionals, lack of education and information, or public apathy are several reasons why there has been little improvement in health care delivery systems.

Serious thought should be given to rule changes in sports where contact or weight limitations are considered paramount for success. However, policy-making bodies cannot make accurate judgments on rule changes because they have no real, factual evidence to support an allegation that a certain practice is injuring a significant number of high school athletes.<sup>2</sup>

Four state-supported offices could effectively assist in the improvement of health care for the

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<sup>2</sup>At this time there is no way to ascertain the numbers of knee, spine, neck, or head injuries that occur each year in Michigan high schools, nor are there adequate historical records available which could show trends in orthopaedic trauma. However, the capability for collection and presentation of such data is readily available through several computer systems in the state, which can accommodate all needed information fairly inexpensively.

interscholastic athlete. They are: (1) the Michigan Health Council, which has an active role in the placement of health care professionals in various fields of employment in Michigan; (2) the Michigan High School Athletic Association, which is responsible for rules enforcement and organization of league and tournament play for all sports; (3) the Michigan Association of Secondary School Principals, a policy-making body of high school officers; and (4) the Michigan State Department of Licensing and Regulation, which controls the certifying of health care professionals. Communication with these groups, either singularly or collectively, would be the first step in attempting to enlist their aid in rectifying the conditions and problems affecting adequate health care, as revealed in this study. Significant improvement can be attained if the aforementioned statewide interest groups and formal organizations lend their support to the cause of improved health care delivery systems for high school athletes.

#### Local Community Responsibility

A review of the various categories measured in the survey gives weight to the inference that the state of Michigan lacks sufficient health care capability for the high school athlete. The physical examination, physician attendance at athletic events, utilization of nurses sponsored by the local community, presence of athletic trainers, distance to emergency medical care, emergency equipment, and

the medical-legal area of athletic administration all need closer scrutiny and action by public and private groups.

The community and its school officials have a significant responsibility and role in finding a satisfactory solution to the problem of inadequate medical coverage of the high school athletic contests. The quickest response to the athletic medicine problem could come from affected local communities. Each high school should have an active parent-teacher group that can advise the local school board of the needs of the high school athletic program and its medical care capabilities. A political force, such as the parent-teacher group (especially if it has been adequately informed through a statewide continuing education program), can bring strenuous pressure on school boards and administrators to provide quality medical care for those students who participate in interscholastic activities.

Adequate health care need not always involve the presence of a physician. In many instances a faculty member can accrue sufficient associate medical training to qualify as an athletic trainer or physician's assistant. An alternative to the athletic trainer from the faculty could be the nurse or physical therapist who can be identified in the local community and solicited to serve in the athletic medicine program.

### Administrators

High school administrators could become a driving force for referendum and change in the present athletic medical policies of the Michigan high schools. Many of the responding principals stated that the biggest impasses in obtaining adequate medical coverage have been: (1) lack of funds to pay physicians, (2) lack of physicians who can be hired to attend athletic events, (3) lack of associate medical personnel in the high school area, and (4) either lack of members on the faculty who will assist the coach or lack of qualified (training and experience) faculty members to attend adequately to the health care problem.

In this regard the researcher recommends that a panel of principals recommend to the state Board of Education and the High School Athletic Association specific problem areas and courses of action to be taken toward the solution of inadequate athletic health care in the state's 714 high schools. It is believed the solutions must be generated through this "in house" method to gain support and favor of the individual high school administrators affected by such action.

### State Legislature

The legislative authority and power of the state of Michigan could be brought to bear on the subject. The credentialing of associate medical professionals could become a reality if (1) the state would authorize such certification

or licensure, and (2) if the position of state-certified athletic trainer were mandated for each high school in the state. These positions could be classified and financed in the same way as coaching positions. Extra monies are allocated for the faculty member who teaches during the day and coaches after school hours. The same remuneration could exist for the faculty member who is credentialed as an associate medical professional or athletic trainer and who would stay after regular school hours to tend to the athletic medical needs of the student interscholastic athlete.

#### Implications for Future Research

The combination of the maturation process and the juvenile's involvement in physical exercise and organized athletics represents a varying period in the growth and development of the human body. As mentioned in the review of the literature, virtually no medical research has been directed to junior and senior high school athletes, except for that begun in the past few years. In addition, recent research has raised more questions than it has answered. Medical practice involving the high school athlete has endured on what Ryan labeled "folklore" medicine.<sup>3</sup> What was done before is good enough and, without contrary scientific argument, it shall prevail.

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<sup>3</sup>Ryan, "Taping Prevents," p. 40.



New studies are needed to examine the practice of depriving the growing high school wrestler of fluids and nutrients so that he can attain a predetermined weight that will qualify him for a contest. It is firmly believed that ignorance and expediency, with only a cursory thought to ethics of the practice, prevail in the state of Michigan. Discussions on the subject with various wrestling coaches have led the researcher to believe that these practices are not to be tolerated any longer than necessary. There is a break in the belief that weight loss is proper, and this break is coming from the younger wrestling coaches. Genuine concern for more than winning is apparently altering, with some merit, the "folklore" training habit of semi-starvation prior to a wrestling contest.

Women's athletics should undergo extensive research. Medical and physical educators lack knowledge and understanding of the pathology of the female body when under a stress and exercise condition. Given the increased popularity of women in athletic competition in educational institutions, researchers have an opportunity to study, under clinical conditions, this neglected area. Findings of such research can be readily applied to the development and promulgation of policies, rules and regulations, and health provisions pertinent to women before undesirable practices and attitudes become firmly established in the administration of women's athletic programs.

To reiterate, little research has been directed to the realm of the thirteen to eighteen-year-old male and female athlete. The subject has not been considered crucial or profitable enough for concentrated medical research. In the estimation of this researcher, this value judgment has been erroneous to the point of negligence on the part of medicine and education. Both owe a different attitude and effort to the youth of this state.

#### Recommendations Regarding Survey Procedures

The survey questionnaire contained fifty questions, of which forty-eight were closed-response questions. The reason for including such a large number of questions was the notion of a thorough inquiry into "every facet" of the medical program pertinent to the interscholastic athlete. Questions were designed and tested, and then mailed to the respondents before the full scope of the research effort was realized by the researcher. As a consequence, the task was too complex to be accommodated by the survey instrument, as well as the available data-processing system.

In this regard, it is recommended that in future research in the athletic medicine field, two procedures be followed: (1) that each question contain no more than nine "yes" or "no" answers or mandatory single responses, since the presently available Control Data 6500 computer will not record any number past nine, and it will indicate only one answer per question (multiple answers are not tolerated by

the computer); and (2) that the survey or research instrument state questions pertaining to a single category of research or those areas that are closely related to the main topic of the survey. The multiple-category questionnaire may appear to be an all-inclusive vehicle that initially should yield many answers, but it can become a concern of major proportions when the time for interpretation of the data is at hand.

The questionnaire replies for 216 respondents required 648 key-punched computer cards. The task could have been considerably lighter had a different questionnaire format been utilized. One viable option would have been to group questions concerning the six major categories reported in the survey into unified presentations, i.e., all the physical examination questions in section one of the survey, all of the questions involving athletic physical training in section two, etc. Within each section, the questions should be designed to offer one response to five alternatives (or more, providing that the nine alternatives are not exceeded). The questionnaire can quite easily be adapted to keypunch cards and in turn the cards can be accommodated by the Control Data 6500 computer.

As noted earlier, omissions of the survey instrument have been mentioned when appropriate. Other concerns are as follows: (1) The researcher should have known more, in advance, about the physician and his role in the actual

sequence of health care delivery to the athlete. This would have included the physician's check of the athlete prior to the game, an audit of the emergency equipment that the physician considers necessary, and the rapport between the coach and the physician. This knowledge would have allowed the researcher to design more specific questions that would have yielded answers about types of equipment desired for the players, and would have established a line of demarcation that would relieve the coach of player participation responsibilities in the determination of player injury and participation and place them in the charge of the physician. Additionally, it would have allowed the researcher to follow the pattern of the physician regarding the actual provisions of a pregame check of the athlete. It would have been helpful to know to what extent the physician evaluated the athlete prior to a contest.

## APPENDICES

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APPENDIX A

QUESTIONNAIRE

## APPENDIX A

### QUESTIONNAIRE

1. Does your high school have a regular team physician (under contract for services)?

Yes \_\_\_\_\_ No \_\_\_\_\_

2. Is the same physician engaged for all sports physical examinations?

Yes \_\_\_\_\_ No \_\_\_\_\_

3. Is the specialty of the team physician:

- a) family practice (general practice) \_\_\_\_\_
- b) orthopedics \_\_\_\_\_
- c) internal medicine \_\_\_\_\_
- d) physical medicine \_\_\_\_\_
- e) other (please state) \_\_\_\_\_

4. Is the team physician in attendance at all home football games?

Yes \_\_\_\_\_ No \_\_\_\_\_

5. Is the team physician in attendance at all or some of the away games?

- a) all
- b) some
- c) none      check one.

6. Do you have a standard physical that student-athletes must successfully pass in order to physically qualify for interscholastic competition?

Yes \_\_\_\_\_ No \_\_\_\_\_

7. Of the qualifying categories, how many are used by your school in physical evaluation of the potential student-athlete? (Please check.)

- a) \_\_\_\_\_ blood pressure
- b) \_\_\_\_\_ family medical history
- c) \_\_\_\_\_ general physical condition (obese or meager build, proportionate to frame)
- d) \_\_\_\_\_ previous personal medical history
- e) \_\_\_\_\_ emotional stability
- f) \_\_\_\_\_ cardiology evaluation
- g) \_\_\_\_\_ orthopedic evaluation
- h) \_\_\_\_\_ eye examination (depth perception, acuity, peripheral)
- i) \_\_\_\_\_ neurologic evaluation

8. Is the team physician a state-licensed allopathic or osteopathic physician?

M.D. \_\_\_\_\_

D.O. \_\_\_\_\_

9. Does your high school have a certified trainer?

Yes \_\_\_\_\_

No \_\_\_\_\_

10. What is the academic or association credential of the trainer of the varsity sports?

- a) \_\_\_\_\_ student, locally trained by physician
- b) \_\_\_\_\_ student, locally trained by coach
- c) \_\_\_\_\_ student, locally trained by trainer (outside school)
- d) \_\_\_\_\_ faculty member, locally trained by physician
- e) \_\_\_\_\_ faculty member, locally trained by coach
- f) \_\_\_\_\_ faculty member, locally trained by trainer (outside school)
- g) \_\_\_\_\_ faculty member, university or college trained by physical education department. If yes, what university or college?
- h) \_\_\_\_\_ faculty member, university or college trained, but as a physical education minor; if yes, what college or university?
- i) \_\_\_\_\_ a licensed physical therapist
- j) \_\_\_\_\_ a member of the National Athletic Trainers Association (certified)
- k) \_\_\_\_\_ a chiropractor
- l) \_\_\_\_\_ other

11. Does your community have access to:

a) a hospital for all medical contingencies:

- \_\_\_\_\_ 1 to 3 miles from school
- \_\_\_\_\_ 4 to 6 miles from school
- \_\_\_\_\_ 7 to 10 miles from school
- \_\_\_\_\_ 11 to 20 miles from school
- \_\_\_\_\_ 21 or more miles from school

b) a physical therapist for athletic rehabilitation within the community or county?

Yes \_\_\_\_\_

No \_\_\_\_\_

12. Do student-athletes have a preseason physical conditioning program administered by a trainer or member of the physical education staff, in the following sports?

- |               |           |          |                  |           |          |
|---------------|-----------|----------|------------------|-----------|----------|
| a) football   | Yes _____ | No _____ | g) track         | Yes _____ | No _____ |
| b) lacrosse   | Yes _____ | No _____ | h) wrestling     | Yes _____ | No _____ |
| c) soccer     | Yes _____ | No _____ | i) swimming      | Yes _____ | No _____ |
| d) baseball   | Yes _____ | No _____ | j) cross country | Yes _____ | No _____ |
| e) basketball | Yes _____ | No _____ | k) gymnastics    | Yes _____ | No _____ |
| f) hockey     | Yes _____ | No _____ |                  |           |          |



13. Does your high school possess and utilize either or both of the following?

Hydrotherapy Equipment	Yes _____	No _____
Electrotherapy Equipment	Yes _____	No _____

14. Is there a nurse position in your high school?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, is the nurse available for treating athletic injuries?

\_\_\_\_\_ intramural, during school day only  
 \_\_\_\_\_ all sports up to 5:00 p.m.  
 \_\_\_\_\_ no contact with athletic injury

15. Is an injured student cared for by:

\_\_\_\_\_ family physician  
 \_\_\_\_\_ school physician

16. Does your high school have any of the following emergency equipment available for athletic injuries (within a 3 to 5 minute time frame)?

- a) quick access to telephone and physician/hospital telephone members  
 Yes \_\_\_\_\_ No \_\_\_\_\_
- b) stretchers and bindings  
 Yes \_\_\_\_\_ No \_\_\_\_\_
- c) blankets  
 Yes \_\_\_\_\_ No \_\_\_\_\_
- d) bandages  
 Yes \_\_\_\_\_ No \_\_\_\_\_
- e) pharmaceuticals (for cuts, abrasions, lacerations) Yes \_\_\_\_\_ No \_\_\_\_\_
- f) motor vehicle for transportation  
 Yes \_\_\_\_\_ No \_\_\_\_\_
- g) first aid trained individual to handle emergency  
 Yes \_\_\_\_\_ No \_\_\_\_\_

17. Can you document athletic injuries through your existing system?

Yes \_\_\_\_\_ No \_\_\_\_\_

18. Does your football team practice on game fields?

Yes \_\_\_\_\_ No \_\_\_\_\_

19. Is your practice field in the same condition as your game field?

Yes \_\_\_\_\_ No \_\_\_\_\_

20. Do you play football games at night (under lights) or daytime? (Circle one)

Night \_\_\_\_\_ Day \_\_\_\_\_

21. Do you play football games on either Friday or Saturday (Circle one), or other \_\_\_\_\_.

Do you practice under the lights at night?

Yes \_\_\_\_\_ No \_\_\_\_\_

22. Is your track composition:

\_\_\_\_\_ sand and clay

\_\_\_\_\_ cinder

\_\_\_\_\_ artificial surface. If so, what type? \_\_\_\_\_

23. Do you play basketball on:

\_\_\_\_\_ artificial surface

\_\_\_\_\_ wood.

24. In the case of legal process for alleged medical malpractice, who becomes the defendant in a suit by a player or family of a player that seeks damages?

a) \_\_\_\_\_ the school physician

b) \_\_\_\_\_ the school

c) \_\_\_\_\_ Is the legal process waived by any means? If yes, by what legal vehicle? \_\_\_\_\_

25. Does your high school have a valid informed consent acknowledgement agreement between the school and the student-athlete, (parents or guardian if in minority status), that explains the schedule of treatment in athletically incurred injuries?

Yes \_\_\_\_\_ No \_\_\_\_\_

26. Do your interscholastic athletic participants have a school sponsored, offseason, weight training program? (By sponsored it is meant to be planned and monitored by a member of the physical education staff or faculty. If yes, circle the party responsible for monitoring of the program.

Yes \_\_\_\_\_

No \_\_\_\_\_

27. The President's Council on Physical Fitness, in a high school study of student-athletes by H. Harrison Clarke in the Physical Fitness Research Digest, stated that there is a correlation between athletic excellence and academic and social success in the high school years. Do you believe that this statement could be valid in your high school? Answer by one of the following measures.

\_\_\_\_\_ The statement applies to the greater majority of athletes in this high school; over 80%.

\_\_\_\_\_ The statement applies to the majority of athletes in this high school; 51-80%.

\_\_\_\_\_ The statement applies to many of the athletes in this high school; 40-50%.

\_\_\_\_\_ The statement applies to some of the athletes in this high school; 20-39%.

\_\_\_\_\_ The statement applies to a few of the athletes in this high school; one-19%.

\_\_\_\_\_ None of the above.

28. How would you rate your athletic department personnel and coaching staffs in regard to the number of physical educators and coaches per sport?

\_\_\_\_\_ Optimum levels of manning have been achieved.

\_\_\_\_\_ Adequate student-instructor, coaching ratios have been achieved.

\_\_\_\_\_ The instruction and coaching of sports are being covered by some faculty, employed outside their specialty. A doubling-up by faculty has guaranteed coverage of our athletic program.

\_\_\_\_\_ Below par manning levels have necessitated the curtailing of some athletic events and programs.

\_\_\_\_\_ Lack of sufficient personnel has led to cancellation of athletics.

29. Would you be in favor of a more centralized athletic medicine program of education, research, and service being inaugurated in this university or any other state university? This would necessitate standardized physical examinations, possible involvement of medical students in the medical administration of your program, possible retraining for the athletic staff in physical training, and rehabilitation and implementation of an athletic injury audit system.

- ☐ Strongly oppose  
☐ Opposed  
☐ Oppose, with some reservation  
☐ Favor, with some reservation  
☐ Favor  
☐ Strongly favor

Appropriate medical coverage of interscholastic athletic contests has long been a subject of discussion in the ranks of high school administrators. In the spaces below you are asked to reply with your preference, pro or con, to the three areas of medical coverage.

30. The following list of sports should receive medical coverage by a qualified physician in every instance of interscholastic, athletic competition.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Football				
Soccer				
Baseball				
Hockey				
Swimming				
Track				
Wrestling				
Cross-country				
Gymnastics				
Lacrosse				

31. The sports listed below should have in attendance at interscholastic sports events a medically qualified athletic trainer (By qualified it is meant that the individual should be either Red Cross certified, or university or college credentialed as a trainer, be a physical therapist, or be certified by The National Athletic Trainers Association).

	Strongly Agree	Agree	Disagree	Strongly Disagree
Football				
Soccer				
Baseball				
Hockey				
Track				
Swimming				
Wrestling				
Cross Country				
Gymnastics				
Lacrosse				

32. Please state your opinion, pro or con, on the subject of new legislation in The Michigan High School Athletic Association regarding mandatory attendance (contracted) by a physician at an interscholastic athletic event. Which sports should have, without fail, proper medical (physician) coverage.

	Strongly Agree	Agree	Disagree	Strongly Disagree
Football				
Soccer				
Baseball				
Hockey				
Track				
Swimming				
Wrestling				
Cross-country				
Gymnastics				
Lacrosse				

33. Do you believe in more stringent rules regarding the weight limitations of high school wrestlers? (This question is asked because of the inherent dangers of rapid weight loss in growth development of the young adult and the lingering cardiological implications of high percentages of weight loss and gain in wrestlers.)

Yes \_\_\_\_\_

No \_\_\_\_\_

34. Are there medical records maintained by either the high school athletic physician or your office regarding athletic trauma? This pertains to the injured athlete by type of injury, treatment, medical payments, rehabilitation, and reinstatement of the athlete to active competition in athletics.

Yes \_\_\_\_\_

No \_\_\_\_\_

If yes, please check appropriate record:

- \_\_\_\_\_ medical history
- \_\_\_\_\_ physical evaluation record (annual, freshman, or sophomore thru senior year)
- \_\_\_\_\_ injury diagnosis and treatment record
- \_\_\_\_\_ rehabilitation record
- \_\_\_\_\_ permission to participate clearance (by physician)
- \_\_\_\_\_ other

35. Do you have any method of establishing the fact that a student-athlete is psychologically adaptable to the sport within which he/she is attempting to participate?

Yes \_\_\_\_\_

No \_\_\_\_\_

If yes, select one of the following:

- a) \_\_\_\_\_ interview with coach of sport
- b) \_\_\_\_\_ interview with physician
- c) \_\_\_\_\_ known medical history
- d) \_\_\_\_\_ parental consultation
- e) \_\_\_\_\_ psychological testing services
- f) \_\_\_\_\_ interview and consultation with school
- g) \_\_\_\_\_ none of the above (Comment if desired.) \_\_\_\_\_

36. Please identify the interscholastic sports your high school supports. Each sport is categorized in three columns; B for boys; G for girls.

	Varsity	Jr. Varsity	Intramural
Football			
Lacrosse			
Swimming			
Soccer			
Baseball			
Basketball			
Hockey			
Track			
Cross-country			
Gymnastics			
Wrestling			

37. Is there a formal classroom session scheduled for the prospective athletic participants that is expressly designed for teaching the rules of the game and the necessity for mental awareness and physical conditioning in any of the following sports?

Football	Yes _____	No _____
Lacrosse	Yes _____	No _____
Swimming	Yes _____	No _____
Soccer	Yes _____	No _____
Basketball	Yes _____	No _____
Hockey	Yes _____	No _____
Track	Yes _____	No _____
Cross-country	Yes _____	No _____
Gymnastics	Yes _____	No _____
Wrestling	Yes _____	No _____

38. When considering the application for employment of a prospective physical education faculty member, do you select them for: (Please rank order 1, 2, 3, etc. the following categories from most important to least important in your estimation.)

\_\_\_\_\_ coaching capability  
 \_\_\_\_\_ personality  
 \_\_\_\_\_ academic background; scientific minor  
 \_\_\_\_\_ physical education background, physiology, anatomy, etc.  
 \_\_\_\_\_ experience  
 \_\_\_\_\_ expertise in a singular sport  
 \_\_\_\_\_ institution attended  
 \_\_\_\_\_ years of coaching experience  
 \_\_\_\_\_ evident adaptability to your school and programs  
 \_\_\_\_\_ academic background (open)

39. If you had a football player ingest his tongue in a practice scrimmage session, do you have a person present who can act appropriately in the situation?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, whom?

\_\_\_\_\_ physician  
 \_\_\_\_\_ Coach  
 \_\_\_\_\_ trainer  
 \_\_\_\_\_ first aid trained individual

40. Are your student-athletes fitted, without exception, to the equipment they will wear in practice and the actual games?

Yes \_\_\_\_\_ No \_\_\_\_\_



41. Beyond the preseason conditioning days of practice, what are the time durations of a daily practice for football outside?

- a) ☐ one hour
- b) ☐ one and a half hour
- c) ☐ one hour and forty-five minutes
- d) ☐ two hours
- e) ☐ two hours plus 15 minutes
- f) ☐ two hours plus 30 minutes
- g) ☐ longer (total time = \_\_\_\_\_)

42. Does your football equipment list include:

- |   |                              |                             |
|---|------------------------------|-----------------------------|
| a) soccer type cleats                         | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| b) neck collars                               | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| c) face guard protection (bird cages)         | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| d) dental protection mouth pieces             | Yes <input type="checkbox"/> | No <input type="checkbox"/> |
| e) elbow and knee abrasion protection devices | Yes <input type="checkbox"/> | No <input type="checkbox"/> |

43. Does your emergency trainer's bag have an airways passage device?

Yes ☐ No ☐

44. Which of the following are practiced on the ankles of your athletes?  
Answer below.

- a) tape - only for game
- b) tape - practice and game
- c) wrap only for practice
- d) wrap practice and game
- e) no external support in practice
- f) wrap only for game
- g) no external support practice or game

The above question and answer apply to:

a) football							
b) hockey							
c) lacrosse							
d) cross-country							
e) wrestling							
f) baseball							
g) basketball							
h) gymnastics							
i) track							
j) soccer							

45. What kind of helmets are used for football?

- a) ☐ full padded lining - plastic shell
- b) ☐ suspension lining - plastic shell
- c) ☐ padded lining - padded shell
- d) ☐ suspension lining - padded shell
- e) ☐ not applicable
- f) ☐ other type \_\_\_\_\_ (fill in)

46. Are your football goal line markers the foam rubber fill, vinyl covered spring type?

Yes \_\_\_\_\_ No \_\_\_\_\_ Not applicable \_\_\_\_\_

47. What source do you utilize in updating athletic training or physical conditioning practices?

- a) ☐ the team physician
- b) ☐ physical therapist
- c) ☐ coach decisions (empirical)
- d) ☐ medical journals
- e) ☐ athletic periodicals
- f) ☐ other \_\_\_\_\_

48. Which of the following changes in football rules would you endorse for the purpose of reducing injury?

- a) ☐ kick offs only after touchdowns (Field goal would give opponent the ball on their 20 yard line.)
- b) ☐ more leeway for officials to call unnecessary roughness on tackling plays (In many instances, it is the third or fourth defender which causes the injury to a ball carrier.)
- c) ☐ ejection from a game for a second face mask violation by a defender
- d) ☐ a five yard "free zone" for the player fielding a punt return; nullified after contact with the ball
- e) ☐ neck collar become mandatory equipment issue (except for quarter-back)
- f) ☐ Any player who is taken out of a game a second time for the same injury should be barred from further competition in that contest. (This applies mostly to head injuries where visual acuity and alertness are measurably impaired.)

49. Assuming that good rules, properly enforced, aid in the prevention of athletic injury, then what are your thoughts about existing rules. What rules, by sport, would you like to see more strongly enforced. If so desired, please comment on the enclosed blank sheet of paper.

50. What new rules would you like to see put into the rules book. Please state by sport. Your comment is appreciated on this question also, keeping in mind that player safety and sportsmanship are paramount in rules considerations.

This high school is a class    A    B    C    D    school.

Due to the anonymity of the questionnaire, this identification is the only way we have an indicator of the response success of the survey.

Thank you for your assistance and consideration.



## APPENDIX B

### LETTER OF INTRODUCTION

## APPENDIX B

### LETTER OF INTRODUCTION

MICHIGAN STATE UNIVERSITY EAST LANSING • MICHIGAN 48824

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COLLEGE OF OSTEOPATHIC MEDICINE • EAST FOR HALL  
DEPARTMENT OF BIOMECHANICS

September 26, 1973

The Department of Biomechanics, Michigan State University, in cooperation with the Michigan High School Athletic Association and the Michigan High School Coaches Association, is conducting a survey of the Michigan high schools regarding the health care delivery systems employed by the high schools in the care of athletes. The athlete we are attempting to focus upon is the male or female student-athlete that is participating in an interscholastic sports event.

The survey is being conducted to identify the health care capabilities of the high schools in general. The questionnaire that is appended to this letter contains questions that address the various facets of athletic medicine that are paramount to the athlete. We recognize the fact that high schools are working with varying economic and conceptual programs. There will be widely diversified ideas and opinions on many of the questions asked. To gain an accurate self-evaluation, we are soliciting your assistance with the assurance that anonymity of all returned responses will be honored. Only the collective information will be subject to editing and evaluation. We do not desire to have a high school identify themselves.

The objective of the survey is to establish the conditions and practices in the Michigan high schools as they exist today. Should the collective responses indicate the necessity for undergraduate educational change at the university level, then we will have a guideline for reevaluation. Additionally, the curriculum of medical education may be positively affected by an acknowledged need within the state school systems. The structure of high school athletics presents the most advantageous organization to work with. There are two reasons for this observation. First, the information will become a valid base from which to construct educational programs in athletic medicine for the physician and the allied health professional. Secondly, the high school, which is envisioned as the potential employer, will benefit from better credentialed associates or faculty members. If a health care need can be recognized and articulated, then an attempt will be made to alleviate that circumstance through an educational mechanism at the university level.

Our request for your assistance reflects the vitality to the survey that your comments contribute. Without perfect candor, the validity of the information becomes an exercise in futility; an expensive one at that.

September 26, 1973  
Page two

A sizable space in the questionnaire has been included for your ideas and desires on athletic medicine. Please make comments that are pertinent to your high school. Be specific when describing the existing conditions and as precise as possible when accounting for the medical care capabilities, by skill, of the school system, community, and county or region.

We do wish to make the most of the survey. Ultimately the high schools of the state should be the primary beneficiary of the educational programs initiated in the University and the State.

Thank you for your cooperation and assistance. They are greatly appreciated.

---

Richard W. Redfearn  
Department of Biomechanics  
Michigan State University

Tel: (517) 353-4730 or 4731



Allen W. Bush  
Director of Athletics  
Michigan High School Athletic  
Association



Robert W. James  
Secretary/Treasurer  
Michigan High School Coaches  
Association

APPENDIX C

FOLLOW-UP LETTER

## APPENDIX C

### FOLLOW-UP LETTER

MICHIGAN STATE UNIVERSITY EAST LANSING • MICHIGAN 48823

---

COLLEGE OF OSTEOPATHIC MEDICINE • EAST FEE HALL  
DEPARTMENT OF BIOMECHANICS

On September 28, 1973, this department, in concert with the Michigan High School Athletic Association and the Michigan High School Coaches Association, mailed to you a 50 question survey form. Enclosed with that survey item was a postcard that was to be utilized as the receipt acknowledgment of the requesting letter and questionnaire.

To this date we have not received any postcard from your high school. This represents an intermission in our efforts to compile accurate data from a maximum number of respondent high schools. We realize that there are a number of reasons why the card and the questionnaire have not yet been received by this office.

This letter is intended to be a reminder that we are depending upon your cooperation to insure completion and accuracy in the survey. Please return the card and the questionnaire form separately at your earliest convenience. The lack of a card from your school has precipitated this letter. The questionnaire remains anonymous.

Thank you for your cooperation.

Richard W. Redfearn  
Office of Athletic Medicine Research  
Department of Biomechanics



APPENDIX D

OPEN-ENDED RESPONSES TO QUESTION FORTY-NINE

## APPENDIX D

### OPEN-ENDED RESPONSES TO QUESTION FORTY-NINE

Question: Assuming that good rules, properly enforced, aid in the prevention of athletic injury, then what are your thoughts about existing rules? What rules, by sport, would you like to see more strongly enforced? If so desired, please comment on the enclosed paper.

Answers: The following answers were taken from the questionnaires. They are presented by class. There is repetition, and not all statements are complete sentences.

#### Class A

1. No face tackling or blocking, spearing etc. in football.
2. Watch for excess use of elbows in basketball.
3. Spear blocking or tackling should be made illegal.
4. Leave rules as they are, but get referees that know how to enforce them.
5. If present rules can be enforced, they seem okay.
6. Football--not enough calls for penalty in piling on, line play, tempers; throw flag on coaches who commit offenses.
7. Basketball--too much contact permitted on rebounding.
8. General--All sports should emphasize sportsmanship.
9. Knock off spearing in football.
10. Stop roughing after whistle.
11. Call face mask violations in football.
12. Rules seem good--in our league the officials do a good job.
13. The spear block; blocking, tackling with head or face driven into the opponent, eliminate this from football.
14. Wedges should not be allowed on kickoff returns.
15. Diving over piles by ball carriers should be outlawed.
16. Rules for contact sports should be evaluated on a year to year basis.
17. The rules need to be enforced by the officials.
18. Enforce the piling-on penalty in football.
19. Enforce the clipping rule in football.
20. Landing pits in track should come under more careful inspection.
21. Wrestling mats should be standardized.
22. Stop hitting with mask and helmet in football.
23. Stop crackback block on linebackers and ends in football.
24. Stop clipping and crackback blocks.

25. No crack back blocking allowed.
26. Main concentration upon good officials--rules we have are good if officials are trained; state very poor in control of officials in all sports.
27. Crack back block and clipping need greater enforcement.
28. Use of forearm by defense should be watched much closer.

#### Class B

1. Get officials to call unnecessary roughness--too much leeway now.
2. More penalty for spearing.
3. Ejection from game for deliberate face mask holding.
4. Enforce crack back block rule.
5. Crack back block; rule needs much better enforcement. Basketball--ejection for defensive player who "cuts down" offensive player on way to basket for a lay-up.
6. Get officials who can enforce the rules and control the game.
7. Better referees who can enforce the rules will mean fewer injuries.
8. Pre-season conditioning, better (more thorough) physical exams and rigid enforcement of the rules will decrease injuries.
9. Illegal use of forearm, "clubbing" should be stopped.
10. Watch closer for head slapping techniques that amount to unnecessary roughness.
11. Face mask violations aren't called enough.
12. Officials should call more unnecessary roughness. Too many players are hurt on late hits.
13. Officials try hard, but many have displayed poor judgment; repeatedly.
14. Intentional fouls, in all sports, should be re-evaluated annually.
15. Eliminate spearing from football.
16. No football equipment until after one week of physical conditioning.
17. Do away with spearing.
18. Better enforcement of "piling on" and "late hitting" in football.
19. MHSAA is doing a good job of rules enforcement.
20. Open football season earlier for better weather. Enforce all rules as currently written and avoid adding others. Too many rules are worse than none.
21. Only shoulder blocks, downfield, should be allowed in football. No cross body blocks at legs--too much injury.
22. Football--I believe [respondent replying] the rule which allows contact by defensive man after offensive line motion, allows defensive man a "cheap" shot to unsuspecting opponent. This rule should be changed to a defensive foul.

Class C

1. Limit the length of athletic competition season.
2. The personal conduct of a participant should be monitored closer--sportsmanship should be paramount. Especially noticeable in basketball.
3. Stop defense from hitting intended pass receiver after an incomplete pass.
4. Enforce roughing the passer rule better.
5. Eliminate the tie-breaking rule.
6. More stringent enforcement of proper bench conduct by coaches.
7. Officials are getting better. An official who has control of a game can help eliminate a lot of injuries.
8. An injured player should be taken out of a game, by mandate, if a doctor cannot give an accurate sideline diagnosis of injury.
9. Pass interference should be at the point of infraction. Kids deliberately interfere on passes greater than fifteen yards from scrimmage.
10. No crack back block at all above or below waist from person outside clip zone at point of snap.
11. Send rules enforcement down to school sponsored seventh and eighth grade programs.
12. Eliminate linoleum basketball courts.
13. Eliminate undercutting an airborne player (layups or jump for rebound).
14. Enforce clipping rules better.
15. Hand-to-hand combat in line play is overlooked by officials.
16. More emphasis on enforcement of spearing in football.
17. Better training for coaches and individuals involved in sports.
18. Tie breaker in high school football should not be used.
19. Eliminate crack back blocks.
20. Enforce clipping violations.
21. Outlaw the crackback block by split end or flanker; and enforce it.
22. Get rid of crack back block.

Class D

1. Present rules are adequate.
2. Football--enforce rules on crackback blocks and unnecessary roughness.
3. Better enforcement of non-contact rules in basketball is needed.
4. A deliberate foul in basketball should have a more severe penalty.

5. When a runner is sliding into a base, make sure the umpire enforces the rule pertaining to the runner sliding into a base and not going after the defensive player.
6. Soccer--watch for unnecessary roughness and foul language.
7. Better and more consistent officiating in ice hockey.
8. All football shoes should be soccer style.
9. More enforcement on clipping.
10. It is hard for some officials to enforce the existing rules.
11. Eliminate cross body block on an interior lineman by a split end or flanker.
12. Poor judgment and mishandling of game conditions are the major cause of athletic injuries--Get better officials. The rules are good if you can get an official with a knowledge of the game and the discipline to use the rules properly.

APPENDIX E

OPEN-ENDED RESPONSES TO QUESTION FIFTY

## APPENDIX E

### OPEN-ENDED RESPONSES TO QUESTION FIFTY

Question: What new rules would you like to see put into the rules book? Please state by sport.

Answers: The statements listed below were taken from the questionnaire form. There may be a bit of redundancy and carry-over from the previous question in Appendix D. Answers will be categorized by class of respondent.

#### Class A

1. All sports--disregard current eligibility standards; use only semester records.
2. Initiate better rules for weight loss for wrestlers.
3. Legislate rules that will eliminate knee and ankle injuries on punts and kickoffs.
4. Make spearing illegal.
5. Mandatory suspension for fights in hockey--possible psychological examination for repeat offenders.
6. Eliminate cross body block in football.
7. Rules are okay; but officials and coaches either do not know them or will not enforce them to keep command of athletic events.
8. Main consideration--referees do not enforce rules and coaches do not teach rules to players.
9. The wedge on kickoffs should be eliminated.
10. No leaping over players for additional yardage.
11. Remove the trampoline from high school gymnastics.
12. Better enforcement of playing surface acceptability. Football fields and basketball floors contribute to athletic injury a great deal of the time.
13. Remove fighters from game (rest of game) in hockey.
14. Make slipping illegal anywhere on the field.
15. Football--put in overtime rule and start from the twenty yard line.
16. None in particular--they have screwed the rules up enough already.
17. Football--all crackback or downfield blocks above the waist.

Class B

1. Basketball--limit schedule to fourteen games and tournament.
2. Basketball--give the fouled team the option of taking the ball out of bounds in the last three minutes of play. This may eliminate intentional fouling.
3. Football--make spear blocking and tackling (using head as a butt) illegal.
4. New rules for weight controls in wrestling.
5. Five yard penalty for face mask unless it is a flagrant violation.
6. Move goal posts to goal line.
7. More stringent requirements for certification of officials.
8. Pass interference--should be first down at point of infraction.
9. Make officials enforce rule that says teams must be on the field of play three minutes prior to second half of play.
10. Tunneling in basketball should be disallowed.
11. Amount of weight reduction in wrestlers should be monitored closer. Some boys lose too much.
12. Make physical examinations fall 30 days, or less, prior to sport competition. As it stands now a boy could get a physical in September and play a spring sport.
13. Football--pass interference--first down at point of foul.
14. Make spearing in football illegal.
15. Intentional fouls, which injure a player, should allow the team that the injured player is on, to kick a field goal--or at least attempt one.

Class C

1. No indian blocking--leaving feet completely to knock opponent down.
2. Eliminate downfield blocking after ten yards from line of scrimmage.
3. Physical examinations must be given prior to each competitive sports season--not once a year.
4. When game conclusion is imminent, i.e., ten seconds to go and first and ten situation, eliminate needless sneak to cause a pile-up--declare the game over.
5. Any school guilty of riotous behavior after school game or contest on school property--should have host privilege suspended, pending league or conference review and recommendation.
6. Football--fair catch should be caught or else it is a free ball.
7. Place ball at point of infraction on pass interference.



8. Kick after touchdown should be one point and run or pass play, done successfully, after touchdown should be two points.
9. Pass interference--ball placed at point of interference and automatic first down.
10. Spearing in football should mean expulsion from the game.
11. Have a standard rule for weight loss in wrestling.

#### Class D

1. Enforce the existing rules better.
2. A rule that demands better crowd control--for the protection of the players and the fans. Too many officials are influenced by the conditions under which they work.
3. I think the state has done an excellent job in the prevention of injuries by the rules in each sport.
4. Michigan should require all officials of all sports to receive training in officiating. This is the greatest single drawback of sports in our state.
5. I would like to see seminars for school people conducted in the upper peninsula for the expressed purpose of teaching how to eliminate or treat athletic injuries.
6. Eliminate the potential hazard of undercutting a basketball player while he is off the floor.
7. Referees do not call piling-on in football the way they should.
8. Eliminate spearing in football.
9. Adopt a standard football shoe that will cut down knee injuries.
10. Bring back finesse to basketball; restrict body contact.
11. Disallow intentional spiking when sliding into a base.

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