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Assessment of the Athletic Medicine Unit in Georgia High Schools

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AN ASSESSMENT OF THE ATHLETIC MEDICINE UNIT
IN GEORGIA HIGH SCHOOLS

by

TIMOTHY R. USSERY

(Under the Direction of BARRY JOYNER)

ABSTRACT

The purpose of this study was to assess the current status of the athletic medicine unit (AMU) in Georgia high schools. An online questionnaire was sent to 432 public and private schools in Georgia, and 109 (25.2% return rate) were completed. The responding schools included 86 public schools and 23 private schools. Results revealed that 54.6% of schools had a team physician with the most common specialty being an orthopedist. Also, 62.6% of the schools had a certified athletic trainer (ATC) with 37.3% being employed by the school. For those schools without an ATC, 70.0% of coaches were providing immediate care for athletes. Significant differences were observed among classifications of schools for the coverage provided to athletes with lower classifications less likely to have a complete AMU. Further study assessing the AMU in Georgia high schools should include an outcome assessment to determine the cost effectiveness of the AMU.

INDEX WORDS: Athletic Medicine Unit, Athletic Training, Certified Athletic Trainer, High School, and Team Physician

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IN GEORGIA HIGH SCHOOLS

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TIMOTHY R. USSERY

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Fulfillment of the Requirements for the Degree

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IN GEORGIA HIGH SCHOOLS

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DEDICATION

I would like to dedicate this thesis to my family. They have allowed me to put in long hours on the computer without many interruptions from my children, Dallin and Rileigh. Special thanks to my wife, Carlene for being supportive and listening when she may not have always known what I was talking about. I would like to thank my in-laws, Cardon and Jackie, who have encouraged me to finish this thesis and provided baby-sitting services to help accomplish this goal. Lastly, I would like to thank my parents, Oliver and Emily, who have always pushed me to achieve more.

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TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS.....	vi
LIST OF TABLES	viii
CHAPTER	
1 INTRODUCTION	1
2 REVIEW OF LITERATURE.....	4
Introduction.....	4
Coaches Knowledge of Athletic Injuries.....	8
History of Athletic Medicine Units in High Schools.....	10
Summary.....	17
3 METHODS.....	19
Participants	19
Instrumentation.....	19
Procedures.....	20
Data Analysis.....	21
4 RESULTS.....	22
5 DISCUSSION	34
REFERENCES.....	42
APPENDICES	
A RESEARCH QUESTIONS.....	45
B QUESTIONNAIRE.....	47
C COVER LETTER AND CONSENT	53

LIST OF TABLES

	Page
Table 2.1: Reportable Injuries and Injury Rates for Selected High School Sports.....	6
Table 2.2: Reported Injury Rates by Type of Session for Selected High School	6
Table 4.1: Results for Chi-Square Test for Team MD and MD Type	26
Table 4.2: Results for Chi-Square Test for Administration of PPE	27
Table 4.3: Results for Type of ATC Game Coverage.....	28
Table 4.4: Results for Type of Training Coaches Possess	31
Table 4.5: Results for Who Provides Immediate Care.....	32
Table 4.6: Results for Who Provides Follow-up Care	33

CHAPTER 1

INTRODUCTION

Athletic training has evolved over the past several decades into a highly specialized profession. The certified athletic trainer (ATC) is a unique allied healthcare provider specializing in the prevention, recognition, treatment and rehabilitation of injuries and illnesses in a variety of settings, including professional sports, colleges and universities, industrial/occupational settings, hospitals and orthopedic offices', outpatient rehabilitation clinics, and high schools. The ATC is often the first healthcare provider from whom an athlete receives care from in addition to proper referral and follow-up care after an injury. In a perfect high school situation, an ATC is present for all practices and games and can quickly evaluate and treat injuries within minutes after they occur. However, in reality this does not always happen. Many high schools only have one ATC, to cover all sports, while some schools do not have an ATC.

In the absence of an ATC, coaches and lay persons are given the responsibility to provide care to student athletes. Research has shown that coaches are under-qualified to make such healthcare decisions, and are influenced in their decision making by game score and athletes' ability level (Lyznicki et al., 1999; Ransone & Dunn-Bennett, 1999; Rowe & Miller, 1991), creating an unreasonable risk of negative outcomes for the injured high school student athlete. Some schools require coaches to be certified in standard first-aid and CPR training. However, some research indicates that even mandatory certification may not be sufficient (Ransone & Dunn-Bennett, 1999; Vangsness, Hunt, Uram, & Kerian, 1994).

More than 7 million high school youth participate in sports each year (National Federation of State High School Association, 2006). In 1999, an injury surveillance study released by the National Athletic Trainer's Association (NATA) had 23,566 reportable injuries and 75,298 athletes. The injury surveillance revealed that an average of 6,000 high school athletes were injured at least once a year, while 55.5% of the injuries reported occurred during practice sessions and 44.4% occurred during games (Powell & Barber-Foss, 1999). Related studies have produced similar findings (Buxton, Okasaki, Ho, & McCarthy, 1995; Janhunen & Green, 1997; Whieldon & Cerny, 1990). With the number of athletes increasing annually, a significant number of athletic injuries should be expected, but every effort should be made to limit the potential for injury (Whieldon & Cerny, 1990). Due to the distribution of injuries, having a certified athletic trainer or physician only on game days is not acceptable (Ballard, 1996; Lindaman, 1992; Mills, 1996; Vangsness, Hunt, Uram, & Kerlan, 1994; Whieldon & Cerny, 1990).

Research indicates a need for a certified athletic trainer on a daily basis to care for athletic injuries due to the incidence of injury (Whieldon & Cerny, 1990). When high school athletes have access to athletic trainers and training room facilities, recovery rates are increased, amount of time out for an injury is decreased, and the number of major injuries is decreased (Buxton, Okasaki, Ho, & McCarthy, 1995; Whieldon & Cerny, 1990). The reduction of risk of injury requires the efficient and judicious use of medical resources, hence the need for an athletic medicine unit. The American Medical Association stated an athletic medicine unit (AMU) should be composed of a physician, an athletic health care coordinator (preferable a NATABOC certified athletic trainer) and other personnel. When looking at the type of allied health care provided at practices in

Georgia high schools, Mills (1996) reported 95/226 (42%) schools had an athletic trainer at organized practices. This leaves 58% of the schools that responded to this study without an athletic trainer at practices. However, his study did not look at which sports were covered.

The purpose of this study was: 1) to assess the current status of the athletic medicine unit in Georgia's high schools and to see if any changes have occurred since Mills study in 1996; 2) to see who administers pre-participating physicals; 3) to see who employs the athletic trainers that provide services to the schools; 4) to determine which sports are covered by an athletic trainer; 5) to see if schools have a designated team physician and his/her specialty; and 6) to determine who is involved with the athlete's immediate and follow-up care.

CHAPTER 2

REVIEW OF LITERATURE

Introduction

Before looking at athletic training in Georgia secondary schools, it is important to gain a basic understanding of the importance of high school athletics. Participation in high school athletics is an important part in the lives of many teenagers. Many of life's important lessons are learned through athletics; these friendships and memories from high school sports often last a lifetime. However, these experiences come with a cost, as the possibility for injury exists in every sport (Harries, 1996; & Powell & Barber-Foss, 1999).

High school sports participation has increased over the last decade from six million to over seven million high school athletes in America (National Federation of State High School Associations, 2005). They also found that 53.6% of students enrolled in high schools participate in sports. Athletic trainers are likely to see more athletic injuries because of the increased number of participants. It has been reported that around two million of the seven million high school athletes incur some type of injury each year (Powell & Barber-Foss, 1999).

Due to the increased overall number of injuries and the litigious nature of society, concerns about the immediate medical care available for high school athletes have been raised by parents, healthcare professionals, coaches and administrators alike (Buxton, Okasaki, Ho, & McCarthy, 1995; Lindaman, 1992; and Rowe & Miller, 1991). In common minor injury situations like sprains, strains and contusions, proper initial care can minimize the extent of injury and prevent excess pain, loss of time and future

complications (Ballard, 1996; Rutherford, Niedfeldt, & Young, 1999; Whieldon & Cerny, 1990).

Whieldon and Cerny (1990) assessed the incidence and severity of injuries per 100 athletes and 1000 athlete exposures. An athlete exposure (AE) is the number of times an injury could have occurred to an athlete during athletic competition. They found the injury rate (IR) for collision sports was 14.5 / 1000 AE. Contact sports had lower IR, 7.9 / 1000 AE. Non-contact/endurance sports had a lower injury than contact sports, 3.8 / 1000 AE resulted in injury (Whieldon & Cerny, 1990). Powell and Barber-Foss (1999) went a step farther and broke down the injury rates by type of session for selected high school sports. They found that the injury rate ranged from 1.7 to 8.1 / 1000 AE based on the sport being played (Table 2.1). The risk of injury differed according to whether the player was participating in a practice session or in a game/competition. Powell and Barber-Foss (1999) reported that injury rates by type of session ranged from 1.8 - 5.3 / 1000 AE in practices, when compared to games that range increased to 1.2 - 26.4 / 1000 AE (Table 2.2). If you take out football (5.3/1000 AE), which is the sport most likely to have medical coverage, wrestling (4.8/1000 AE) and basketball (3.4/1000 AE) become the sports with the most injuries in practice sessions. Wrestling and soccer have the highest the injury rate during game situations.

Table 2.1**Reportable Injuries and Injury Rates for Selected High School Sports**

	Boys' Sports					Girls' Sports				
	Baseball	Basketball	Football	Soccer	Wrestling	Basketball	Field Hockey	Softball	Soccer	Volleyball
Reportable Injuries	961	1933	10557	1765	2910	1748	510	910	1771	601
Injured Players	756	1538	7310	1521	2166	1399	442	795	1442	628
Case rate/100 players	13.2	28.3	50	23.4	35.9	28.7	18.2	16.7	31.4	14.2
Case rate/1000 athlete-exposures	2.8	4.8	8.1	4.6	5.6	4.4	3.7	3.5	5.3	1.7

Note. From "Injury patterns in selected high school sports: a review of the 1995-1997 seasons," by J.W. Powell and K.D. Barber-Foss, 1999, *Journal of Athletic Training*, 34(3), p. 281.

Table 2.2**Reported Injury Rates by Type of Session for Selected High School**

	Boys' Sports					Girls' Sports					
	Baseball	Basketball	Football	Soccer	Wrestling	Basketball	Field hockey	Softball	Soccer	Volleyball	
Practice											
Case rate/1000 athlete exposures		1.8	3.4	5.3	2.5	4.8	3.2	3.2	2.7	3.1	2.8
Game											
Case rate/1000 athlete exposures		5.6	7.1	26.4	10.2	8.2	7.9	4.9	5.9	11.4	1.2

Note. From "Injury patterns in selected high school sports: a review of the 1995-1997 seasons," by J.W. Powell and K.D. Barber-Foss, 1999, *Journal of Athletic Training*, 34(3), p. 281.

High school sports participation is at an all time high. Similarly, sports-related injuries have also substantially increased (Bell, Prendergast, Schlichting, & Mackey, 2005; Buxton, Okasaki, Ho, & McCarthy, 1995; & Harries, 1996). In a review of injuries during the 1995-1997 seasons for 10 high school sports, the NATA accumulated data for more than 75,000 player-seasons (one person on one team in one season). During the period of time studied, 23,566 reportable injuries occurred. All sports studied, with the exception of soccer, showed the same or greater percentage of injuries during practices versus games (Buxton, Okasaki, Ho, & McCarthy, 1995 & Powell & Barber-Foss, 1999). These statistics show that injuries can and do occur, indicating the need for certified athletic trainers in the high school setting during practice and games.

Several professional organizations have shown support for the presence of certified athletic trainers in secondary schools. The American Academy of Family Physicians (AAFP) has taken a stance on this issue stating, “The AAFP encourages high schools to have, whenever possible, a National Athletic Trainers Association (NATA)-certified or registered/licensed athletic trainer as an integral part of the high school athletic program.” (AAFP, 2001) The National Athletic Trainers’ Association has issued an official statement on ATC’s in high schools which states:

“The National Athletic Trainer’s Association as a leader in health care for the physically active believes that the prevention and treatment of injuries to student athletes are a priority. The recognition and treatment of injuries to student athletes must be immediate. The medical delivery system for injured student athletes needs a coordinator within the local school community who will facilitate the prevention, recognition, treatment, and reconditioning of sports related injuries.

Therefore, it is the position of the National Athletic Trainers' Association that all secondary schools should provide the services of a full-time, on-site, certified athletic trainer (ATC) to student athletes." (NATA, 2005a)

A second official statement by the NATA (2005b) states that other allied health professionals do not have the same qualifications as a certified athletic trainer in regards to providing proper assessment, treatment, and return-to-play decision making following an athletic injury. Physical therapists are not a good choice because they lack training in the area of immediate care. EMT's would not be a good choice for providing health care to athletes because they do not have the rehabilitation skills needed to help the athlete return to play.

Coaches Knowledge of Athletic Injuries

While Rowe & Miller (1991) found that 82% of coaches responding to their survey had taken a course in athletic injuries, several studies testing coaches' knowledge and retention have revealed dismal performance (Ransone & Dunn-Bennett, 1999; Rowe & Miller, 199; Rowe & Roberston, 1986). Ransone and Dunn-Bennett found that only 36% of surveyed coaches passed the First Aid Assessment. Only 27% of respondents (89% of which was coaches) received a passing grade (70%) in all 6 categories of care assessed by Rowe and Robertson (1986). For example, only 24.4% knew what a strain was, and alarmingly only 43.4% knew that when an athlete complains of paresthesia, loss of strength and inability to move one arm, a fractured cervical vertebrae may be indicated. In a follow-up study 5 years later, Rowe and Miller (1991) found that despite CPR & first aid certification by 83 and 89% of respondents, respectively, coaches' overall performance on the knowledge assessment was still a failing 67%. There was no

statistically significant difference between average scores in each category between the studies (Rowe & Miller, 1991).

The NATA (2005b) states that decision making in the situations encountered by certified athletic trainers should not be left up to coaches or laypeople, as they lack the proper education and training to handle these situations. In 1998, the American Medical Association (AMA) also gave their endorsement for the employment of certified athletic trainers by secondary schools. In a report of the council on scientific affairs, the AMA stated:

“Although many high schools have coaching staffs dedicated to teaching appropriate sports skills and tactics, it cannot be assumed that all coaches are adequately trained or sufficiently motivated to monitor and treat the injuries that occur during practices and competitions. Few, if any, high schools provide daily physician coverage to meet these needs. To provide such coverage, coaches need the assistance of certified athletic trainers who can recognize and manage the wide variety of injuries and medical conditions that occur among high school athletes. Certified athletic trainers can provide more continuous and comprehensive on-site medical coverage, particularly at practices, where most injuries occur and when team physicians are seldom available.” (Lyznicki et al., 1999)

As a result of this report, the AMA adopted several statements into policy. The AMA (1998) declared its belief that the Board of Education and Department of Health in each state should encourage the development of an Athletic Medicine Unit at every school offering athletics. They stated that the Athletic Medicine Unit should consist of a

physician, a coordinator, which would preferably be a certified athletic trainer, and any additional medical personnel deemed necessary. The AMA also strongly encouraged high school administrators, coaches, and athletic directors to take the necessary steps to secure adequate funding to obtain the services of a certified athletic trainer. Finally, in light of the reality that not every high school will be able to obtain the services of a certified athletic trainer, the AMA recommends that all high school coaches are properly trained in emergency first aid and basic life support (AMA, 1998).

History of Athletic Medicine Units in High Schools

There are several articles discussing certified athletic trainers and secondary schools in individual states. The state of Hawaii has established an outstanding model for obtaining ATCs in secondary schools (Buxton, Okasaki, Ho, & McCarthy, 1995). In 1990-1991, a study was conducted to evaluate athletic health care in the 21 public high schools on the island of Oahu. None of the 21 schools had a certified athletic trainer on staff, and the six schools that claimed to have an ATC actually had a non-certified athletic trainer. Thirteen of the high schools listed a coach as the person assuming the role of athletic trainer, while two other schools have paramedics that serve as athletic trainers. In 17 schools the coach was designated as the “person responsible for the prevention and care of athletic injuries”, while other schools listed the non-certified athletic trainer, a student trainer, and the school nurse. Only three schools reported all coaches being certified in basic first aid. Two of the high schools reported the coach was primarily responsible for making a return to play decision after injury (McCarthy, Hiller, & McCarthy, 1991).

In 1991, Buxton, Okasaki, Ho, and McCarthy (1995) collected data on secondary school athletic training in Hawaii. The data that they collected served as one step of a multifaceted approach to secure legislative funding to increase the number of certified athletic trainers in public secondary schools in Hawaii. The first phase of their approach consisted of an educational program directed towards parents, coaches, athletic directors, and school administrators. The purpose of this program was to raise awareness of the risks of participation in athletics, and to educate those in attendance about the many roles and benefits of the certified athletic trainer. The authors felt as though this program convinced those participating, that athletic health care in Hawaii did not meet the accepted standards of care for high school sports.

Following this educational program, a survey was sent out to evaluate athletic health care in all 61 of Hawaii's secondary schools (public and private). The return rate for the survey was 100%. Year-long injury surveillance study found the 38 public schools in the study reported 2,718 injuries. Fifty-seven percent of these injuries occurred during practices, with the remaining 48% occurring during games. In regards to injury severity, 79% of injuries were considered mild (missing one to seven days), 10% moderate (missing eight to 21 days), and 11% major (missing more than 21 days). Looking at the initial treatment provided following injury, eight percent of both mild and moderate injuries, and five percent of major injuries received no treatment at all (Buxton, Okasaki, Ho, & McCarthy, 1995). This raises concerns about the quality of care being provided to athletes participating in high school sports. A third phase of the project consisted of an extensive media campaign utilizing newspaper and television to continue to increase awareness of the issue of athletic health care.

Finally, the state athletic directors association began lobbying for better athletic healthcare. They approached the state legislature under the premise that the main issue needing to be dealt with related to educational health and safety. The efforts of the athletic directors led to the house and senate education committees backing the project and introducing a series of bills which ultimately led to the hiring of 38 certified athletic trainers, one for each public school. The legislature agreed to fund the program for two years as a pilot program, after which time it would be reevaluated to determine further actions (Buxton, Okasaki, Ho, & McCarthy, 1995).

Hawaii has established a statewide athletic training program providing health care to high school athletes, that same standard of care is not seen nationwide. Studies conducted in Georgia, Michigan, North Carolina, Illinois, South Carolina, Southern California, and Wisconsin reveal the inadequacy of healthcare provided to high school athletes (Mills, 1996; Lindaman, 1992; Ballard, 1996; Bell, Prendergast, Schlichting, Mackey & Mackey, 2005; Carek, Dunn, & Hawkins, 1999; Vangsness, Hunt, Uram, & Kerlan, 1994; Rutherford, Niedfeldt, Young, 1999; Nass, 1992). Mills (1996) surveyed athletic directors in Georgia and had a 56% response rate. It was reported that 64% of the schools that responded had a team physician. The type of physician varied greatly between family practice physician (31%) and orthopedic physician (63.4%). An orthopedic physician was the preferred choice over a family physician in AAAA, AAA, and A schools. While AA schools were the reverse, 58.6% reported using a family practice physician and 37.5% reported using an orthopedic physician. With most injuries occurring during practice, a team physician was rarely available (average of less than 11.5%) with all classifications combined. Of the schools surveyed they reported that

50% of AAAA schools had an ATC at practice, while only 16.1% A schools reported having an ATC. The majority of A (64.5%) and AA (54.6%) schools reported that no allied health care was provided during practices. He found that over 70% of the allied health care was provided by a clinic in all classifications. In A (74.2%) and AA (63.6%) coaches were serving as the athletic trainer for these schools.

Coaches are often placed in situations where they are not only responsible for teaching skill in practice, they maybe responsible for serving as the athletic trainer. Sixty-nine percent of the schools stated that coaches had only first-aid and CPR certification. However, only 29.3% of the schools required coaches to be certified in first-aid and CPR while almost 8% of the respondents stated that their coaches had no training in athletic injuries. In 1986, Rowe and Robertson stated: "...possibly hundreds of incorrect decisions are made on a daily basis" (pg. 119). The findings by Mills in 1996 clearly demonstrate that this is a possibility in Georgia's high schools.

Mills (1996) research indicated that team physician and allied health care professionals were primarily responsible for immediate care of injuries during games, for follow-up care, and return-to-play decisions. This shows the beginning of an athletic medicine unit forming. When the availability of the team physician is in question allied health care professionals are then able to determine return-to-play status. However, clinics are providing most of the services therefore this can be positive and negative. Clinics are only providing minimal care meaning one to two visits per week; this leaves it up to the coaches at the schools to provide day to day care. Therefore, use of the AMU is needed to help determine if the athlete is ready to return to activity.

Mills (1996) also studied the number of coaches providing follow-up and immediate care to high school athletes. Mills (1996) found that coaches are responsible for follow-up care in 15/62 (24.2%) of A schools, 10/44 (22.6%) AA schools compared to 3/62 (4.8%) in AAAA schools. Not only were coaches responsible for follow-up care of the athlete they were primarily responsible for prevention, care and rehabilitation of athletic injuries. Mills (1996) found in 38.5% schools, coaches had this responsibility. In smaller schools 55/106 (51.8%) of this burden was placed on coaches. The most alarming result was that 154/173 (89%) of the schools said that coaches provide immediate care for injured athletes at practices.

Lindaman (1992) surveyed high schools in Michigan and found that only 41% of all responding schools had an athletic trainer available for at least one sport throughout the year, with 70% being NATA certified. Of the responding schools that offered football, only 37% reported having athletic trainer coverage. Seventy-eight percent of varsity teams were without athletic trainer coverage at any one point in time during the season. Interestingly, one-third of the athletic trainers from responding schools received no compensation for their services, with 30% of the certified athletic trainers also being volunteers (Lindaman, 1992). Based on the results of this study, Lindaman (1992) concluded that the medical care provided to interscholastic athletes in Michigan was not adequate.

Ballard (1996) surveyed all high schools in North Carolina to identify the current athletic care and injury prevention services provided to student athletes. Seventy-one percent of the high schools reported having a designated team physician; 62% were orthopedic surgeons, 29% family practitioners and 8% other. High schools used coaches,

certified athletic trainers, non-certified athletic trainers, emergency medical technicians and school nurses to help provide medical care to student athletes. Surprisingly, 86% of the reported schools employed athletic trainers with 51% of those certified by the NATA. Coaches were responsible for providing medical coverage at 57% of all practices and 65.8% of all athletic competitions. With coaches providing most of the immediate care only 18% of the schools required coaches to be certified in first aid and 20% requiring CPR certification.

Bell et al. (2005) mailed surveys to all Illinois High School Association member schools as a part of an annual newsletter requesting information about their individual athletic programs. Forty-four percent (316/724) of the surveys were returned. Physician availability varied significantly by locale of the school and size of the school. One hundred thirty-six schools (43.3%) had at least one physician for athletics, 55 schools (40.4%) had more than one physician available. An orthopedist was available at 66 schools (21%); a family physician was available at 59 schools (19%).

While 229/316 schools (72.9%) had athletic trainers designated as the medical care provider the availability varied significantly by locale and size. The results showed fewer small schools (59%) had athletic trainers as compared to large schools (87%). The availability of athletic trainers also varied greatly by the locale of the school, ranging from 62% of rural schools to 94% of suburban high schools. Only 40.8% of the schools that responded required their coaches to be certified in first aid. As in similar studies only a small amount (36.2%) of schools required certification in CPR and only 18.7% required coaches to maintain certification in automatic external defibrillator (AED) training (Ballard, 1996; Bell et al., 2005; Carek et al., 1999; & Mills, 1996).

Vangness et al. (1994) surveyed 240 high schools in Southern California primarily looking at medical coverage of football. Only 69% of schools reported having an athletic trainer present for home games, while the percentage of schools having an athletic trainer at practices was not addressed in the study. Seventy-one percent of responding schools had a team physician or physicians for football. Among the paid coaches of the schools studied, 90.7% were CPR certified, while only 81.4% had received basic first aid training. Eighty-nine percent of schools had first aid or trauma kits, however, only 75.4% had a telephone close to the field. The lack of a nearby phone becomes a major issue because only 37.5% of schools reported having a staffed ambulance available at home games. If no ambulance is present and it becomes necessary to call for one, this process would take much longer without having a phone nearby. This is probably no longer an issue due to the overwhelming increase in the use of cell phones.

A similar study was done in South Carolina to examine conditions of health care coverage and delivery to high schools in the state. Carek et al. (1999) surveyed public and private high schools in South Carolina and reported 67% of schools having a team physician. They also reported that 82% of schools had an athletic trainer assigned to the football team; however, the exact qualifications of the athletic trainer were not studied. Forty-one percent of schools had football coaches that were trained in basic first aid, while only 30% of schools reported coaches were trained in CPR. In discussing the results of the study, Carek et al. (1999) noted that larger schools were more likely to have a physician at home football games; however, the smaller schools were more likely to have a coach with training in basic life support.

Summary

Prevention and care of high school sports injuries is an important health issue in Georgia. Although many high schools have coaching staffs dedicated to teaching appropriate sports skills and tactics, it cannot be assumed that all coaches are adequately trained or motivated to monitor and treat the injuries that occur during practices and competitions. Few, if any, high schools provided daily physician coverage to meet these needs. To provide such coverage, coaches need the assistance of certified athletic trainers who can recognize and manage the wide variety of injuries that occur among high school athletes. Certified athletic trainers can provide more continuous and comprehensive on-site medical coverage, particularly at practices, where most injuries occur and when team physicians are rarely available. Because many schools lack the funds to hire athletic trainers to be available for all practices and games, coaches should also be trained to recognize and respond appropriately to injured athletes.

Various medical associations have adopted official statements in which is stated a requirement for a comprehensive athletic medical unit in high schools to replace the more traditional approach of providing medical coverage only at athletic events. High school administrators need to support efforts and activities to develop a well organized and integrated program to protect all student athletes and provide the best possible care for injured athletes during both practices and competitions. Although all high schools may not have the resources to implement a sports medicine program, all high schools can designate an individual to work with the team physician to prevent injuries, provide immediate medical care, and rehabilitate injured athletes. Ideally, this person is a certified athletic trainer who has the education and training to provide appropriate medical care for

injured athletes and the administrative training to conduct the athletic medicine unit. By hiring a certified athletic trainer, school administrators, team physicians, coaches and parents have assurance that an individual is on staff who has the knowledge, skills, responsibility, and commitment to protect the health, safety, and well-being of all sports participants.

CHAPTER 3

METHODS

Participants

Participants for this study consisted of all Athletic Directors in high schools in the state of Georgia. The participants were identified through classification lists from the Georgia Independent School Association (GISA) and the Georgia High School Association (GHSA). The GISA is comprised of 124 private independent, and parochial schools throughout the state. While some of these schools are private they may chose to participate in the GHSA. Schools in GISA are divided into three classifications, which are listed as AAA, AA, and A. Placement in AAA is based on enrollment comprising grades 8-12 of 120 students and above. Schools with 90-119 students compete in AA, and 89 or less compete in A. These classifications are recalculated every two years.

The GHSA is composed of 402 schools; the membership of the Association shall be divided in five (5) classifications as follows: 1) 15% AAAAA, 21% AAAA, 21% AAA, 21% AA, 22% A; and 2) Schools with the same F.T.E. count separated by a percentage break point will be placed in the higher classification. The classifications are determined by enrollment in grades 9-12. Reclassification occurs every two years in the GHSA.

Instrumentation

An online questionnaire using Survey Monkey was constructed in an attempt to evaluate the current medical coverage being provided to high school athletes throughout the state of Georgia. The questionnaire was modified from previous studies on athletic health care services in secondary schools (Lindamen, 1992; Mills, 1996; Rowe &

Robertson, 1986; Sexton, Schmoldt, & Miles, 1994) and a position proposal guide for certified athletic trainers in secondary school athletic programs developed by the National Athletic Trainers' Association Secondary School Athletic Trainers' Committee (1999). A pilot study was done by four colleagues to determine if the questionnaire format, content, expression and importance of items, and whether questions should be added or deleted. The only changes were to make all questions concerning sports consistent throughout the survey. A second pilot study was done by three coaches with administration background to make sure responses are clear and appropriate and no changes were made. The questionnaire was composed of 30 multiple choice questions (Refer to Appendix B). The questionnaire took approximately 8-10 minutes to complete.

Procedures

The Institutional Review Board approved all procedures before the research was started. The list of schools and names for Athletic Directors in the state of Georgia was obtained from the GISA and the GHSA. Email addresses were obtained from organizations and individual school web sites. A cover letter stating the purpose of the study, along with the request for participation was included in the initial survey e-mailing. Each athletic director was asked to complete an online survey using Survey Monkey. A second e-mailing containing a cover letter, link to the survey and a thank you was e-mailed one week later; this was repeated a week later. The final e-mailing was then sent the next week as a reminder to complete the survey in attempt to increase the response rate.

Data Analysis

The data collected from the questionnaire, were analyzed to determine means (\pm SD) and percentages. Responses between public and private schools as well as across classification will be compared using Chi-Square. The differences between observed and expected frequencies were considered significant if the chi-square value is equal to or less than the .05 level of probability.

CHAPTER 4

RESULTS

Of the 432 high schools contacted, 109 completed the survey for a response rate of 25.2%. The responding schools included 86 (78.9%) public schools and 23 (21.1%) private schools. The responding schools included 19 (17.4%) 1-A schools, 21 (19.3%) 2-A schools, 19 (17.4%) 3-A schools, 29 (26.6%) 4-A schools and 21 (19.3%) 5-A schools. These percentages are similar to the total number of schools surveyed (75.4% public and 24.5% private). Student athletes competing in the 109 high schools totaled 51,353 (28,924 boys and 22,429 girls) participating in athletics. The average number of boys and girls participating in sports at each high school is 265.36 (\pm 171.23) boys and 207.68 (\pm 164.71) girls. The range of experience for athletic directors that participated in the survey was 1 to 40 years with an average of 8.27 (\pm 8.1) years experience.

No significant difference ($p < .05$) was observed between public and private schools in the number of on and off-site sports. Public schools reported having an average of 5.13 (\pm 2.06) on site spring sports when compared to 2.95 (\pm 1.15) winter and 3.96 (\pm 1.15) fall sports. Private schools reported having more off site sports compared to public schools. Private schools averaged more total on site sports 13.69 (\pm 10.43) than public schools 12.04 (\pm 3.65) but this was not a significant difference ($p < .05$).

Athletic directors reported 54.6% ($n=59$) of schools had a team physician; of these 76.3% ($n=45$) were orthopedic physicians and 25.4% ($n=15$) were considered family physicians. Significant differences ($p=.033$) existed between 3-A and other classifications in having a team physician (see Table 4.1). The 5-A schools had an orthopedic (100%) at football games, other schools had an orthopedic at least 64.3% of

the time. The use of a family physician was seen at the lower classifications. Five-A schools did not use a family physician to cover football games.

There was no significant difference among the classifications for physician supervision at practices ($p>.05$). However, 50% (29/58) schools reported never having a physician present at practice and 41.4% (24/58) reported a physician present less than 50% of the time. Team physician coverage at varsity football games was significant ($p=.023$) between classifications. Three out of five classifications reported 100% having a team physician present at varsity football games, while 1-A schools only had 60% and 4-A schools had 83.3% (see Table 4.1). Single-A schools were less likely to have a physician at varsity games when compared to other classifications. Of the schools that have a physician, 91.5% ($n=54$) were present at varsity football games.

There was no significant difference among the classifications for presence of a physician at varsity games for the following sports: boy's basketball, girl's basketball, wrestling, baseball, softball, boy's soccer, girl's soccer, and volleyball. A trend was seen that 5-A and 1-A schools were less likely to have a physician at boys basketball games when compared to other classification levels. Coverage of a physician at junior varsity games was not significantly different between classifications, but health care coverage for these games was not equal to varsity coverage.

The type of pre-participating physical exam (PPE) was studied to determine how student athletes received physicals. There was one significant difference ($p=.005$) observed between classifications in the type of PPE administered to the student athletes (see Table 4.2). Team Physicians provided PPE's to 5-A (42.9%) more than other

classifications. All classifications are more likely to provided group PPE's to student athletes more than any other way of administrating PPE's.

In the present study we observed how many schools had an ATC. When looking at the number of schools having a Certified Athletic Trainer there was no significant difference between public (61.9%) and private (65.2%) schools ($p > .05$). There were no significant differences seen between having an ATC and classification level ($p > .05$) (see Table 4.2). Public schools had an average of 1.23 ($\pm .469$) ATC per school, while the private schools had 1.40 ($\pm .828$) ATC per school. Although there were no significant differences seen with ATC coverage at football practice between classification levels ($p > .05$) there was a noticeable trend. Of the 1-A schools that reported having an ATC, 71.4% of them had an ATC at football practice while, 90.5% or greater of the schools with an ATC in classifications 2-A through 5-A reported having an ATC at football practice. Although not significant ($p > .05$), the same trend continued for other sports with lower classifications less likely to have an ATC cover practices. Another noticeable trend was that schools with an ATC were more likely to cover baseball than softball.

Significant differences were not seen between classification level and ATC coverage of home or away football games ($p > .05$). Of the 67 schools that have an ATC, only four of those schools did not have an ATC at home football games.

Significant differences ($p = .033$) were observed between classification when examining ATC girl's basketball at home (see Table 4.3). Three-A was the only classification to report not having an ATC at all home girl's basketball games.

Use of a Chi-square test indicated that significant differences ($p = .035$) existed for the number of ATC's covering wrestling at home between classifications (see Table

4.3). Only 42.9% of 1-A schools had an ATC that covered home wrestling. A trend was seen that showed all classification levels were less likely to travel with wrestling.

In the current study the employer of the ATC was observed to determine how many ATC were employed by schools. Of the schools with an ATC, 58.2% (39/67) reported the ATC came from a clinic or hospital. In the 5-A classification ATC are more likely to be provided by a sports medicine clinic (40%) or a school (33.3%) than any other employment method. In 4-A classification the ATC is more likely to be employed by the school system (42.9%) than any other method. In 2-A, the ATC is employed more frequently by a physical therapy clinic (30.8%), hospital and school (23.1%) than other methods. ATC at the 1-A level are most likely employed by the school system (42.9%) and the hospital (28.6%) than other methods.

Table 4.1

Results for Chi-Square Test for Team MD and MD Type

Question	Classification					df	p-value
	5-A (n=21)	4-A (n=28)	3-A (n=19)	2-A (n=21)	1-A (n=19)		
Does your school have a team physician?							
Yes	12 (57.1%)	18 (64.3%)	14 (73.7%)	10 (47.6%)	5 (26.3%)	4	0.033*
No	9 (42.9%)	10 (35.7%)	5 (26.3%)	11 (52.4%)	14 (73.7%)		
If yes, what is his/her specialty?							
Family Practice	0 (.0%)	4 (22.2%)	6 (42.9%)	4 (40%)	1 (20%)		
Orthopedic	12 (100%)	13 (72.2%)	9 (64.3%)	7 (70%)	4 (80%)		
Pediatrician	0 (.0%)	4 (22.2%)	2 (14.3%)	0 (.0%)	0 (.0%)		
Other	0 (.0%)	4 (22.2%)	2 (14.3%)	0 (.0%)	0 (.0%)		

Note. Values are the total number of responses for each classification. Values enclosed in parenthesis represent the percentages of responses for a question for individual classification. * represents a significant chi-square (<.05). MD = Medical Doctor

Table 4.2

Results for Chi-Square Test for Administration of PPE

Question	Classification				df	p-value
	5-A (n=21)	4-A (n=29)	3-A (n=19)	2-A (n=21)		
Who is responsible for administering the PPE? (Check all that apply)						
Group physicals	11 (52.4%)	17 (58.6%)	14 (73.7%)	15 (71.4%)	11 (57.9%)	4 0.558
Team MD provides physicals	9 (42.9%)	3 (10.3%)	1 (5.3%)	4 (19%)	1 (5.3%)	4 .005*
Family responsible for physicals	11 (52.4%)	14 (48.3%)	7 (36.8%)	9 (42.9%)	10 (52.6%)	4 0.838
Does your school have a certified athletic trainer?						
Yes	15 (71.4%)	21 (77.8%)	11 (57.9%)	13 (61.9%)	7 (36.8%)	4 0.063
No	6 (28.6%)	6 (22.2%)	8 (42.1%)	8 (38.1%)	12 (63.2%)	

Note. Values are the total number of responses for each classification. Values enclosed in parenthesis represent the percentages of responses for a question for individual classification. * represents a significant chi-square (<.05).

Table 4.3

Results for Type of ATC Game Coverage

Question	ATC Game Coverage			Count
	Home	Away	N/A	
What type of game coverage does the ATC provide?				
Football	52.1% (63)	47.1% (57)	0.8% (1)	121
Boys Soccer	88.4% (61)	11.6% (8)	0.0% (0)	69
Boys Basketball	75.0% (66)	25.0% (22)	0.0% (0)	88
Baseball	84.8% (56)	13.6% (9)	1.5% (1)	66
Girls Soccer	89.6% (60)	9.0% (6)	1.5% (1)	67
Girls Basketball	75.6% (65)*	23.3% (20)	1.2% (1)	86
Wrestling	85.7% (54)*	11.1% (7)	3.2% (2)	63
Softball	86.2% (50)	10.3% (6)	3.4% (2)	58
Volleyball	85.1% (40)	10.6% (5)	4.3% (2)	47
Other	81.0% (17)	14.3% (3)	4.8% (1)	21
			<i>answered question</i>	67

Note. Table was collapsed across all classification levels because few significant differences were observed. * represents a significant chi-square ($p < .05$).

Of the responding schools, 37.3% (n=25) employed an ATC. No significant difference ($p < .05$) was noticed between classification in ATC's employed by schools. However, the breakdown by classification is interesting. The number of schools having an ATC employed by schools in each classification was: A (3/7), AA (3/13), AAA (5/11), AAAA (9/21), and AAAAA (5/15). Of these 45.8% of them were full time athletic trainers with teaching responsibilities, while 33.3% had full time athletic training duties only. Schools reported that 20.6% of the ATC was a part time athletic trainer with teaching responsibilities. Five-A was the only classification to report not having an ATC with full time athletic training responsibilities only.

Coaches were found to serve as the athletic trainer 70% of the time when schools had no certified athletic trainer. Five-A schools (83.3%) were more likely to have a coach

or coaches fill the responsibility of the athletic trainer when the school did not have an ATC followed by 1-A and 3-A (75%) schools. Surprisingly the physician was selected to fill the responsibility of an ATC in smaller classifications (1-A – 3-A). Physical therapists were found to fill the role in the absence of an ATC 30% of the time among all classifications. In 1-A (33.3%) and 2-A (25%) schools the nurse was used to fill athletic training responsibilities. The nurse (17.5%) was the less likely than the EMT (20%) to fill the role as athletic trainer.

There were no significant differences ($p=.057$) observed between classification in the type of training coaches possess in prevention and care of athletic injuries. Coaches in 1-A (22.2%) and 2-A (25%) were not trained in first-aid, CPR and AED when compared to the other classifications (above 75%). A total of 46.4% of coaches in all classifications had training in first-aid and CPR. A total of 53.6% of coaches in all classifications were trained in first-aid, CPR and AED training (see Table 4.4).

Several significant differences existed between classifications in the provider of immediate care for the injured athlete (see Table 4.5). The first was observed between classifications in ATC's providing immediate care at practices and games. No significant differences ($p=.052$) existed between 1-A not having an ATC at practices when compared to other classifications. A significant difference ($p=.018$) existed between 1-A not having an ATC at games when compared to other classifications. Significant differences ($p=.010$) were observed between 2-A and other classifications in having a nurse provide immediate care at practices. The coach provided immediate care at practices 70.6% of the time; this was more than any other health care provider.

Significant differences ($p=.035$) were found to exist in the classification and the coach providing follow-up care with the injured athlete (see Table 4.6). The physician (82.6%) and the ATC (58.7%) were the most likely to provide follow-up care and evaluation with the student athlete. No significant differences existed between classifications in who makes the decision whether the athlete can return to play. The physician (85.3%) and the ATC (55%) were most likely to make the decision when an athlete can return to play.

Table 4.4

Results for Type of Training Coaches Possess

Question	Classification				
	1-A (n=9)	2-A (n=4)	3-A (n=6)	4-A (n=4)	5-A (n=5)
If coaches act as the team athletic trainer, what types of training do they possess in prevention and care of athletic injuries?					
First Aid	2 (22.2%)	1 (25%)	1 (16.7%)	0 (0%)	1 (20%)
First Aid and CPR	6 (66.7%)	2 (50%)	3 (50%)	0 (0%)	2 (40%)
First Aid and CPR and AED training	2 (22.2%)	1 (25%)	5 (83.3%)	3 (75%)	4 (80%)
Instructed by a Certified Athletic Trainer	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (20%)
No training	0 (0%)	0 (0%)	0 (0%)	1 (25%)	0 (0%)

Note. There was a no significant difference ($p = .057$) between classification in the type of training the coach possesses.

Table 4.5

Results for Who Provides Immediate Care

Question	Classification												
	1-A		2-A		3-A		4-A		5-A		Practice	Game	
	Game	Practice	Game	Practice	Game	Practice	Game	Practice	Game	Practice			
Who provides "immediate care" for the injured athlete?													
Physician	2 (10.5%)	0 (0%)	9 (42.9%)	2 (9.5%)	7 (36.8%)	2 (10.5%)	9 (31%)	0 (0%)	10 (47.6%)	0 (0%)			
Certified/Licensed Athletic Trainer	5 (26.3%)	4 (21.1%)	13 (61.9%)	11 (52.4%)	11 (57.9%)	12 (63.2%)	22 (75.9%)	18 (62.1%)	11 (52.4%)	11 (52.4%)			
Physical Therapist	3 (15.8%)	0 (0%)	4 (19%)	3 (14.3%)	3 (15.8%)	2 (10.5%)	1 (3.4%)	1 (3.4%)	3 (14.3%)	1 (4.8%)			
Nurse	1 (5.3%)	0 (0%)	2 (9.5%)	4 (19%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (4.8%)			
EMT/Paramedic	4 (21.1%)	2 (10.5%)	6 (28.6%)	3 (14.3%)	5 (26.3%)	1 (5.3%)	6 (20.7%)	2 (6.9%)	8 (38.1%)	3 (14.3)			
Coach	11 (57.9%)	14 (73.7%)	7 (33.3%)	15 (71.4%)	11 (57.9)	12 (63.2%)	12 (41.4%)	20 (69%)	7 (33.3%)	16 (76.2%)			
Other	1 (5.3%)	1 (5.3%)	1 (4.8%)	0 (0%)	0 (0%)	0 (0%)	2 (6.9%)	1 (3.4%)	0 (0%)	0 (0%)			

Note. There was a significant difference ($p = .010$) between classification and nurse providing immediate care at practice. There was a significant difference between classification and ATC providing immediate care at games ($p = .018$)

Table 4.6

Results for Who Provides Follow-up Care

Question	Classification				
	1-A	2-A	3-A	4-A	5-A
Who provides "follow-up care" for the injured athlete?					
Physician	16 (84.2%)	12 (76.2%)	16 (84.2%)	25 (86.2%)	17 (81%)
Certified/Licensed Athletic Trainer	7 (36.8%)	13 (61.9%)	11 (57.9%)	22 (75.9%)	11 (52.4%)
Physical Therapist	5 (26.3%)	7 (33.3%)	6 (31.6%)	6 (20.7%)	7 (33.3%)
Nurse	1 (5.3%)	3 (14.3%)	0 (0%)	0 (0%)	1 (4.8%)
EMT/Paramedic	1 (5.3%)	0 (0%)	2 (10.5%)	1 (3.4%)	1 (4.8%)
Coach*	6 (31.6%)	9 (42.9%)	3 (15.8%)	2 (6.9%)	6 (28.6%)
Other	0 (0%)	0 (0%)	0 (0%)	1 (3.4%)	0 (0%)

Note. There was a significant difference ($p = .010$) between classification and coach providing follow-up care.

CHAPTER 5

DISCUSSION

Participating in high school athletics allows one to learn a sport or skills, mature as an individual, learn a team concept, and have fun. However, with these benefits there comes risk. When an athlete participates in sports they are at risk of becoming injured. More than 7 million high school youth participate in sports each year (National Federation of State High School Association, 2006) and an average of 6,000 athletes are injured at least once a year (Powell & Barber-Foss, 1999). It is important for one to take these things into account when contemplating sports.

The purpose of this study was to assess the current status of the athletic medicine unit (AMU) in Georgia's high schools. A review of literature revealed a similar study was performed by Mills (1996). In an attempt to gather information on the current status of athletic medical unit in Georgia's high schools a questionnaire was modified from the Mills (1996) study. The survey was e-mailed to 432 public and private schools in Georgia, and 109 were completed and returned. Significant differences were observed between classifications for the athletic medicine unit provided to student athletes in the state of Georgia.

The leader in the AMU should be the team physician and preferable an orthopedist. A significant difference ($p = .033$) was observed between classifications in having a team physician. Of the schools surveyed 54.6% had a team physician. This was down (64%) from the survey done by Mills (1996). Trends were observed between classifications in the specialty of practice of the physician designated as team physician. Of the schools that have a physician 76.3% of them were orthopedists. These physicians

have the knowledge to complete an injury evaluation and possess the medical expertise required to make decisions regarding injury treatment. However, one concern when asking physicians to provide these services is their availability at each practice (50% never present, 41.4% present less than 50%, 8.6% present at least 50%) and competition (football 91.5%, all other sports 20% or less).

While physicians are capable of performing injury evaluations and rendering decisions about injury treatment, they generally are not available to perform these duties at all practices and games. Therefore, providing an individual to specifically provide injury evaluation and treatment services at all athletic activities has been recommended. The AMA (1998) recommended that schools sponsoring athletic programs establish an AMU that consists of a physician and an athletic health coordinator (AHC). The AMA (1998) further suggested that athletic organizations place an ATC in the role of AHC.

Certified athletic trainers acquire professional skills and expertise in the prevention and care of sports related injuries through structured academic and practical experiences (Lyznicki et al., 1999). This includes extensive coursework in the basic sciences with core studies in human anatomy and physiology, kinesiology, psychology, personal and community health, nutrition, exercise physiology, first aid and emergency care, prevention and evaluation of athletic injury, therapeutic rehabilitation, use of treatment modalities, and healthcare administration. This extensive knowledge and skills make ATC's an excellent choice for the AHC. The percentage of schools having an ATC was up from 42% in 1996 (Mills, 1996) to 62.6% (67/107) based on current findings. The larger number of ATC's in Georgia high schools can be attributed to the increase in the

profession of athletic training and the increase in awareness for the need of certified athletic trainers in high schools.

A trend was seen between classifications in the number of schools having an ATC. Single-A schools (36.8%) were less likely to have an ATC when compared to all other classifications. However, this was up from 25.8% in 1996 (Mills). A possible reason why Single-A schools are less likely to have an ATC is the available resources. Single-A schools have few students therefore they are given less money by the state. When the single-A school is not the only school in the county, the public tends to donate more time and money to the larger school. Also, smaller/more rural towns are not known to have the resources needed to help schools find an ATC. The rural locations of many single-A schools leads to fewer allied healthcare clinics and doctor offices. Therefore, single-A schools are less likely to have an ATC. The present study found that ATC's were providing immediate care at practices 51.4% of the time and at games 56.9% of the time. ATC's were found to provide follow-up care and evaluation of the injured athlete 58.7% of the time across all classifications.

One area of concern is the number of schools that still rely on coaches to provide services of an athletic trainer when a school does not have an ATC. Of the schools surveyed that did not have an ATC, 70% of the time the coach was identified to fill the role of the athletic trainer. Because of this role coaches should have adequate knowledge of first aid principles to act prudently in the case of injury or sudden illness experienced during athletic participation. Rowe and Miller (1991) gave a test to determine coaches' knowledge of first-aid to Georgia coaches and found that only 38% (50/130) achieved passing scores, even though 89% had current first-aid certification. A similar study

(Ransone & Dunn-Bennett, 1999) also found that while most coaches are first-aid certified they may not know proper first-aid procedures. Although individual schools may require coaches to be certified in first-aid (52%) and CPR (63.3%) the state of Georgia does not require certification. Requiring these certifications is not enough to guarantee retention or acquisition of information pertaining to athletic injury care, especially since 63% of coaches failed the first-aid assessment (Ransone & Dunn-Bennett, 1999). This is an area of concern that needs to be addressed by administrators and/or school boards. When coaches serve as the athletic trainer it was found that 46.4% (13/28) were certified in first-aid and CPR and 53.6% (15/28) included AED training. A trend was observed that coaches at small schools had first-aid and CPR, while coaches at larger schools had training in first-aid, CPR and AED. While coaches are available on-site at each practice and game they are only able to provide temporary support until professional medical assistance is available.

Standard first-aid courses do not teach the specifics regarding athletic related injuries so many coaches have not been taught how to make these types of decisions. A study done in Alabama by Rowe and Robertson (1986) found that 24.4% of coaches surveyed knew that a strain occurs when musculoskeletal tissue is damaged or weakened. This is one of the most common types of injuries that occur in sports. When asked who provides immediate care to injured athletes, the coach was responsible at practice in 77/109 (70.6%) schools and at games in 48/109 (44%) schools. For this reason coaches should be made aware of the Sports Safety Training class offered by the American Red Cross. This class is designed for coaches to help keep their athletes safe and enable

coaches to prevent, prepare for and respond to sports-related injuries (American Red Cross Sports Safety Training, 2007).

While coaches are a viable option for providing immediate injury evaluation and treatment this may not be the best choice. The NATA (2005b) states that decision making in the situations encountered by certified athletic trainers should not be left up to coaches or laypeople, as they lack the proper education and training to handle these situations. During practice and competition coaches focus their energy on supervising their athletes and instructing them in the skills of the game. Coaches should not be expected to split their attention between evaluating athletes, making return to play decisions, and their coaching duties.

Findings in the present study indicated that 68/109 (62.4%) of the schools had an emergency action plan (EAP). This is crucial to the success of the injured athlete continuing his/her career in athletics. When an EAP is in place it allows the athletic medicine unit to work in harmony. All parties know their responsibilities and their limitations. When schools do not have an EAP they can be found negligent, which is defined as what another minimally competent individual, educated and practicing in that profession, would have done in the same or similar circumstance to protect an individual from harm or further harm. The individual responsible for providing athletic training services could be held to the standard of care expected of an NATABOC-certified athletic trainer. Being properly licensed and practicing within established standards of practice are strong safeguards against litigation.

Another finding in the present study was the presence of recording systems of athletic injuries in 68/109 (65.1%) of the schools. Coaches and persons designated by

schools as the athletic trainer have to be made aware of the changes that have taken place in recent years in injury care and treatment. There are legal responsibilities placed on schools to have qualified persons attending the athlete on the practice field as well as athletic contests (Rowe and Miller, 1991). Recording systems are the appropriate method for keeping the information about an athlete when they are injured. With the rise of law suits in today's society, there is a need to document every injury and rehabilitation that occurs. Documentation of injury is a source of protection for the individual that has provided care to an injured athlete.

There are numerous types of recording systems. The main thing to look for in a recording system is the ability to document athletic injuries, treatment, and reconditioning, in accordance with generally accepted standards of their respective state practice acts. It is important to facilitate communication among the members of the AMU all patient encounters should be documented in adherence with federal, state, and local regulations while keeping within the recommendations set forth by the Health Insurance Portability and Accountability Act (HIPAA, 1996) when applicable. Patient records should be maintained in such a manner as to ensure privacy and confidentiality in all circumstances. Failure to abide by these acts and other state and federal laws can result in law suits and loss of certification of coaches and/or athletic trainers.

This study was limited in that only, 109/432 (25.2%) of the secondary schools responded. In contrast to the study in 1996 (Mills) the number of schools responding to that study was 226/400 (56%). Due to the small number of private schools that responded comparison could not be made between public and private schools. Furthermore, due to

the discrepancies in the number of schools competing in the GISA and GHSA, it is difficult to analyze the data with respect to public and private schools.

A study by Powell and Barber-Foss (1999) found if you take out football, which is the sport most likely to have medical coverage; wrestling and basketball become the sports with the most injuries in practice sessions. While wrestling has more injuries than basketball, findings in the present study showed that 64.2% of the schools had an ATC at wrestling practice compared to 79.1% of schools that had an ATC at basketball practice. In this study there was no way to determine if a school provided wrestling as a sport. This may have occurred because more schools provided basketball compared to wrestling. Therefore the true percentage of ATC coverage at practice is unknown. Wrestling and soccer had the highest the injury rate during game situations (Powell and Barber-Foss, 1999). The findings in the present study demonstrate that 91% of schools had an ATC at soccer games while ATC's at wrestling matches was 80.6%. This difference in coverage could be attributed to the number of clinics providing care just to football. While this is a large percentage overall there was a significant difference ($p=.035$) between classifications in wrestling coverage at home. Only 42.9% of schools in classification A had an ATC at home wrestling; while all other classifications were above 69.2%.

In conclusion, this study provided data that demonstrated student athletes participating at larger schools had greater access to the athletic medicine unit compared to smaller schools. These findings should not only be of concern to administrators and coaches, but to parents and student athletes as well. The overall access to an athletic medicine unit needs improvement in all classifications for both public and private schools. The number of ATC's employed by schools needs to be increased. Schools

should take the initiative to hire ATC's as a full time staff member. They also should not rely on just one ATC to provide adequate medical coverage to all high school athletes.

High school athletics continues to grow each and every year, but the medical care for high school athletics has remained the same over the last 10 years in Georgia. It seems that the majority of athletic directors in Georgia are content with having allied healthcare providers paying for covering high school athletics. Of the schools surveyed only 25/67 (37.3%) schools employed certified athletic trainers. This means that 41/67 (61.1%) of the schools rely on ATC from an allied healthcare provider. This creates a void when the ATC from the clinics are not at school, leaving coaches responsible for providing care to the student athlete. It was clear from the present study that coaches have only first aid, CPR and maybe AED training at best. This supports the statement that the overall athletic medicine unit needs improvement in Georgia high schools. Finally, this study clearly demonstrates that certain schools are not getting adequate medical coverage for their student athletes. They should examine ways to improve this service.

Future research assessing the athletic medicine unit in Georgia high schools should include an outcomes assessment study. This would demonstrate if the individual providing health care to the athlete is performing their duties in an efficient and cost effective manner. This would help administrators see the need for an ATC as an integral part of the athletic staff.

REFERENCES

- American Academy of Family Physicians (2001). Sports Medicine Policy, Athletic Trainers for High School Athletes. Available at: <http://www.aafp.org/online/en/home/policy/policies/s/sports.html>. Accessed June, 19 2007.
- American Medical Association (1998). H-470.995 Athletic (Sports) Medicine. Available at: <http://www.ama-assn.org>. Accessed June 19, 2007.
- American Red Cross (2004). Sport Safety Training. Available at: <http://www.redcross.org/services/hss/courses/sports.html>. Accessed June 19, 2007.
- Ballard, P.A. (1996). Athletic care and injury prevention services provided to high school student athletes in North Carolina: Opinions of athletic directors. *NASSP Bulletin*, Oct, 106-112.
- Bell, K., Prendergast, H.M., Schlichting, A., Mackey, E., & Mackey, M., (2005). Preparedness among Illinois high school athletic departments: Does size or location matter? *The Internet Journal of Health*, 4 (2).
- Buxton, B.P., Okasaki, E.M., Ho, K.W., & McCarthy, M.R., (1995). Legislative funding of athletic training positions in public secondary schools. *Journal of Athletic Training*, 30 (2), 115-120.
- Carek, P.J., Dunn, J., & Hawkins, A., (1999). Health care coverage of high school athletics in South Carolina: Does school size make a difference? *The Journal of the South Carolina Medical Association*, Nov, 420-425.
- Harries, T.J. (1996). Medical coverage of high school sports. *Maryland Medical Journal*, 45 (8), 686-689.

Health Insurance Portability and Accountability Act., Public Law 104-191, 104th Congress. 1996.

Janhunen, M.A., & Green, R.C., (1997). Injury management in high school athletics. *Coach and Athletic Director*, 67 (5), 4-9.

Lindaman, L.M. (1992). Athletic trainer availability in interscholastic athletics in Michigan. *Journal of Athletic Training*, 27 (1), 9-18.

Mills, F.H. (1996). *Athletic health care services in Georgia's secondary schools*. Unpublished master's thesis, Georgia Southern University, Statesboro.

Nass, S.J. (1992). A survey of athletic medicine outreach programs in Wisconsin. *Journal of Athletic Training*, 27 (2), 180-183.

National Athletic Trainers' Association. (2005a). Secondary school official statement. Available at: <http://www.nata.org/statements/official/highschools.pdf>. Accessed February 15, 2007.

National Athletic Trainers' Association. (2005b). Official Statement on Athletic Trainers in High Schools. Available at: <http://www.nata.org/statements/official/highschools.pdf>. Accessed February 15, 2007.

National Federation of State High School Associations. (1997). *National federation of state high school associations handbook: 1996 High school athletics participation survey*. Kansas City, MO.

Powell, J.W., & Barber-Foss, K.D. (1999). Injury patterns in selected high school sports: A review of the 1995-1997 seasons. *Journal of Athletic Training*, 34 (3), 277-284.

Ransone, J., & Dunn-Bennett, L.R., Assessment of first-aid knowledge and decision making of high school athletic coaches. *Journal of Athletic Training* 34 (3), 267-271.

Rowe, P.J., & Miller, L.K. (1991). Treating high school sports injuries: are coaches/trainers competent? *Journal of Physical Education, Recreation, and Dance*. 62, 49-54.

Rowe, P.J., & Robertson, D.M. (1986). Knowledge of care and prevention of athletic injuries in high schools. *Athletic Training*, Summer, 116-119.

Rutherford, D.S., Niedfeldt, M.W., & Young, C.C. (1999). Medical coverage of high school football in Wisconsin. *Clinical Journal of Sports Medicine*, 9 (4), 209-215.

Sexton, J., Schmoldt, K., & Miles, H. (1994). Job marketability survey for athletic trainers in selected Midwestern states. *Journal of Athletic Training*, 29 (3), 208-212.

Vangsness, C.T., Hunt, T., Uram, M., & Kerlan, R.K. (1994). Survey of health care coverage of high school football in southern California. *The Journal of Sports Medicine*, 22 (5), 719-722.

Whieldon, T.J., & Cerny, F.J. (1990). Incidence and severity of high school athletic injuries. *Athletic Training*, Winter, 344-350.

APPENDIX A
RESEARCH QUESTIONS

1. What is the number of student athletes participating in sports?
2. Is there a team physician and what is the specialty of the medical professional providing care for the student athletes?
3. What is the medical coverage provided during practice and games?
4. Are there differences in physician coverage among student athletes between private and public high schools?
5. What is the number of schools with Certified Athletic Trainers?
6. Are there differences in athletic training coverage among student athletes between classifications, in both private and public high schools?
7. What is the qualification of the individual(s) determining when an athlete can return to activity?
8. Do the coaches have any first aid education and if they do what type?
9. Is there any presence of injury recording during practice and games?
10. Have there been any changes in athletic training coverage provided to high school athletes since Mills' study in 1996?

Limitations

This study will be limited by the following: the honesty of participants in answering the questionnaire and the return rate of the questionnaire.

Delimitations

This study will be delimited to: Athletic Directors as listed by the Georgia Independent School Association and Athletic Directors as listed by the Georgia High School Association.

Assumptions

The following assumptions will be made: all lists of Athletic Directors are correct and the participants will answer the questionnaire honestly.

Definitions

Athletic Medicine Unit- The athletic medicine unit is made up of an allopathic or osteopathic physician, an athletic health coordinator (preferable a NATABOC certified athletic trainer), and other personnel.

NATABOC Certified Athletic Trainer- An athletic trainer that has met the educational and hour requirements and successfully completed a three part certification exam as determined by the National Athletic Trainers' Association Board of Certification. The American Medical Association recognizes him/her as an allied health care provider.

State Licensed Athletic Trainer (LAT) - Individuals who have passed a state exam, they may or may not be eligible for NATABOC certification.

APPENDIX B
QUESTIONNAIRE

Athletic Medicine Unit in Georgia High Schools

Please answer all questions appropriately.

1. How long you been an Athletic Director? _____
2. Classification of high school is:
 - a. Public
 - b. Private
3. What level does your high school compete?
 - a. 1-A
 - b. 2-A
 - c. 3-A
 - d. 4-A
 - e. 5-A
4. Approximately how many total students participate in activities throughout the year?
Boys _____ Girls _____
5. What is the number of **On-site Sports** during:
Fall Sports _____ Winter Sports _____ Spring Sports _____
6. What is the number of **Off-site Sports** during:
Fall Sports _____ Winter Sports _____ Spring Sports _____
7. Does your school have a team physician(s)?
 - a. Yes
 - b. No
8. If **yes to # 6**, what is his/her specialty? (Check all that apply)
 Family Practice
 Orthopedic
 Pediatrician
 Other (specify) _____
9. What type of physician supervision is provided at organized practices?
 - a. Physician always present
 - b. Physician sometimes present (at least 50% of the time)
 - c. Physician occasionally present (less than 50% of the time)
 - d. Never present

10. For what sports is a team physician present at varsity games? (Check all that apply)

- Football
- Basketball Boys
- Basketball Girls
- Wrestling
- Baseball
- Softball
- Soccer Boys
- Soccer Girls

11. Is the same coverage provided at junior varsity games?

- a. Yes
- b. No

12. Who is responsible for administrating the pre-participating physicals? (Check all that apply)

- Group physicals provided to all sports.
- Team physician provides physicals to all sports.
- Family is responsible for finding a physician to provide physical.

13. Who serves as the team Athletic Trainer for your school? (Check all that apply)

- Certified/Licensed Athletic Trainer*
- Physical Therapist
- Physician
- Coaches
- School Nurse
- EMT/Paramedic
- Other (please specify) _____

* A certified athletic trainer is one that has met the educational and hour requirements and successfully completed a three part certification exam as determined by the National Athletic Trainers' Association Board of Certification.

14. Does your school have a certified athletic trainer? (**If no skip to # 18**)

- a. Yes
- b. No

15. How many certified athletic trainers does your school have? _____

16. If your school has a Certified Athletic Trainer which practices do they cover?

- Football
- Soccer B/G
- Basketball B/G
- Baseball
- Softball
- Volleyball
- Wrestling
- Other

17. If your school has a Certified Athletic Trainer what type of **game coverage** do they provide?

Football:

___ Home ___ Away

Soccer:

___ Home ___ Away

Basketball:

___ Home ___ Away

Baseball:

___ Home ___ Away

Softball:

___ Home ___ Away

Volleyball:

___ Home ___ Away

Wrestling:

___ Home ___ Away

Other:

___ Home ___ Away

18. If your school has a Certified Athletic Trainer that provides health care services for your athletes who employs this person?

- a. Sports Medicine Clinic
- b. Physical Therapy Clinic
- c. Hospital
- d. University
- e. School Employee
- f. Other _____

19. If they are a school employee, what is the employment status of your ATC?

- a. Full time with Athletic Training duties only.
- b. Full time Athletic Trainer with teaching responsibilities.
- c. Part time with Athletic Training duties only.
- d. Part time Athletic Trainer with teaching responsibilities.

20. Who provides “immediate care” for the injured athlete at games? (Check all that apply)

- ___ Physician
- ___ Certified/Licensed Athletic Trainer
- ___ Physical Therapist
- ___ Nurse
- ___ EMT/Paramedic
- ___ Coach
- ___ Other (please specify) _____

21. Who provides “immediate care” for the injured athlete during practices? (Check all that apply)

- ___ Physician
- ___ Certified / Licensed Athletic Trainer
- ___ Physical Therapist
- ___ Nurse
- ___ EMT/Paramedic
- ___ Coach
- ___ Other (please specify) _____

22. Who provides the follow-up care and evaluation for the injured athlete? (Check all that apply)
- Physician
 - Certified/Licensed Athletic Trainer
 - Physical Therapist
 - Nurse
 - EMT/Paramedic
 - Coach
 - Other (please specify) _____
23. Who makes the decision about whether the athlete can return to practice and/or game? (Check all that apply)
- Physician
 - Certified/ Licensed AT
 - Physical Therapist
 - Nurse
 - EMT/Paramedic
 - Coach
 - Other (please specify) _____
24. If coaches act as the team athletic trainer, what types of training do they possess in prevention and care of athletic injuries?
- a. First Aid
 - b. First Aid and CPR
 - c. First Aid and CPR and AED training
 - d. Instructed by a Certified Athletic Trainer
 - e. No training
 - f. Other (please specify) _____
25. Are your coaches required to be certified in First Aid?
- a. Yes
 - b. No
26. Are your coaches required to be certified in CPR?
- a. Yes
 - b. No
27. Are your coaches required to be certified in Automatic External Defibrillator (AED) training?
- a. Yes
 - b. No
28. Do your coaches or athletic trainer have access to an AED?
- a. Yes
 - b. No
29. Does your school have a written emergency medical plan for athletics?
- a. Yes
 - b. No

30. Does your school have a recording system to document all athletic injuries?
- a. Yes
 - b. No

If **yes**, who is responsible for maintaining those records?

- Physician
- Certified/ Licensed Athletic Trainer
- Physical Therapist
- Nurse
- EMT/Paramedic
- Coach
- Other (please specify) _____

APPENDIX C
COVER LETTER AND CONSENT

Dear Athletic Director,

My name is Tim Ussery, Certified Athletic Trainer at Statesboro High School and a graduate student at Georgia Southern University. As part of my graduate work, I am doing my master's thesis on the status of athletic medical units in Georgia high schools. To accomplish this task, I am surveying Athletic Directors at every high school throughout the state. All procedures have been approved by the Georgia Southern University Institutional Review Board. The survey can be accessed by going to the following link: <http://www.surveymonkey.com/s.asp?u=841333557411>

This survey takes less than 10 minutes to complete and all responses will remain anonymous and confidential. When you submit the survey, no names will be associated with the responses. There is no obligation to complete the survey but your responses are important to the success of the research. If you wish to participate, please do so by May 7, 2007.

If you would like a copy of the results from this study, please email me at tussery@bulloch.net and I will forward you a copy.

Thank you,
Tim Ussery, ATC