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Despite the recommendation of the American Medical Association, National Federation of High School Athletic Associations, and the National Athletic Trainers' Association for secondary schools to employ athletic trainers (ATs), only 37% of public secondary schools and 27-28% of private secondary schools (Huggins, et al., 2019; Pike, et al., 2017; Pike, et al., 2016, Pryor et al, 2015) nationwide provide full-time access to an AT. North Carolina Administrative Code (NCAC) requires each school district to designate either an AT or a first responder (FR) for each high school to provide medical care for football and wrestling athletes. Previous research indicates that FRs perceive themselves as lacking the knowledge to manage most of the common causes of death of athletes (Eilbacher, 2010). Without access to an AT, the safety and well-being of secondary school athletes in North Carolina is impacted.

A sequential mixed-methods study was conducted. A web-based survey assessed how often ATs and FRs met each of the standards and evaluated differences between ATs and FRs with the elements of the standards. Participants represented ATs ( $n = 115$ ) and FRs ( $n = 47$ ) from all eight regions and all four classifications of the North Carolina High School Athletic Association. Follow-up focus groups were conducted with ATs ( $n = 13$ ) and FRs ( $n = 3$ ) to determine the barriers and facilitators to meeting the twelve standards. Statistically significant differences between ATs and FRs were found in six of the 12 standards. Significantly more ATs than FRs performed services related to the 19 of the 28 elements of the standards. Knowledge questions related to the most common causes of fatalities in sports revealed that FRs were less knowledgeable about management of exertional heat stroke, cervical spine injuries, and sudden cardiac arrest.

Four themes in two categories (personal and organizational) emerged related to barriers to meeting the standards. The personal barrier to meeting the standards, lack of knowledge, was most prevalent with FRs. Organizational barriers to meeting the standards included lack of support, resources and time. Two themes in two categories (personal and organizational) emerged for facilitators to meeting the standards. These themes were relationships and structures.

The differences in medical care provided by ATs and FRs combined with the lack of knowledge of FRs, who are not required to work under the supervision of a physician and less likely to have a formal agreement with a physician or an established athletic health care team (AHCT), increases the likelihood of athletes at those schools receiving less appropriate care. Because there is a lack of understanding of the role of ATs (Clines, et al., 2017; Eason, et al., 2019; Felling, 2003; Jaquith, & Hanley, 2018; Mensch, et al., 2005, Weitzel, et al., 2015), it is important to educate the stakeholders about the differences in medical care between ATs and FRs.

A COMPARISON OF MEDICAL CARE BETWEEN ATHLETIC TRAINERS AND FIRST  
RESPONDERS AT NORTH CAROLINA HIGH SCHOOL ATHLETIC ASSOCIATION  
MEMBER SCHOOLS

by

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Approved by

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This project is dedicated to high school athletes in North Carolina, especially my  
three boys, because you all deserve the best possible medical care.

APPROVAL PAGE

This dissertation, written by SUSAN C. EDKINS, has been approved by the following committee of the Faculty of The Graduate School at the University of North Carolina at Greensboro.

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## CHAPTER I

### PROJECT OVERVIEW

Recognizing the inherent risk of injury in secondary school sports, the American Medical Association (AMA), the National Federation of High School Athletic Associations (NFHS), and the National Athletic Trainers' Association (NATA) all recommend that secondary schools employ athletic trainers (ATs) to provide appropriate care for their athletes (Almquist, et al., 2008, AMA Resolution, 1998; NFHS, 2016). Unfortunately, only 37% of public secondary schools (Huggins, et al., 2019; Pike, et al., 2017; Pryor et al, 2015) and 27-28% of private schools (Huggins, et al., 2019; Pike, et al., 2017; Pike, et al., 2016) nationwide provide full-time access to an AT. This lack of access to ATs is especially true in rural areas (Pike, et al., 2017) and those in which there is a higher degree of poverty (Post, et al., 2018).

North Carolina Administrative Code (2019) requires each school district to designate either an AT or first responder (FR) for each high school. The code also requires an AT or FR to be present for football practices and games (2019) and the NCHSAA also requires them to be present for wrestling home matches (2019). The code specifies that a FR must complete and maintain CPR and first aid certification, concussion management training, continuing education in injury prevention and management, and 10 hours per year of staff development related to first aid, injury recognition and prevention, which can include their CPR renewal (NCAC, 2019). In order to be licensed as an AT in North Carolina, a person must graduate from a Commission on Accreditation of Athletic Training Education (CAATE) accredited athletic training program and

pass the national Board of Certification (BOC) examination (NCGA, Article 34, 1997). Thus, there is a significant difference in the educational requirements between ATs and FRs. In addition, research has shown that there is a lack of understanding of the role and value of ATs among parents, coaches, athletic directors, administrators and emergency medical services personnel (Clines, et al., 2017; Diakogeorgiou, et al., 2017; Felling, 2003; Jaquith, & Hanley, 2018; Mensch, et al., 2005, Weitzel, et al., 2015). The North Carolina athletic training licensure law has a specific exemption that allows secondary schools to hire people who are not licensed to “perform the activities of athletic trainers in the scope of their employment” provided they do not “claim to be licensed under this article” (NCGA Article 34, 1997, 90-535).

Because FRs are permitted to perform the duties of an AT at the secondary school, they are expected to provide the same level of care as an AT. However, previous research demonstrates that they perceive themselves as lacking knowledge in caring for injuries of the head, neck, cervical spine, and low back (Eilbacher, 2010). In addition, FRs with fewer than four years of experience were less likely to perform the skills associated with caring for environmental illnesses such as heat stroke (Eilbacher, 2010). With head, cervical spine, and heat illnesses being among the most likely causes of death in sports (Casa et al., 2012), it is essential that each condition is managed appropriately. Without full-time access to ATs, many injuries may be cared for improperly and often parents or coaches who have no medical training are left to decide how an injury should be managed (Cross, et al., 2010). In addition, FRs do not meet the American Medical Association’s definition of a qualified health-care professional (Cooper, et al., 2019).

Access to health care involves availability of a health-care provider as well as appropriateness of both the health-care provider and the care they provide (Levesque, et al., 2013). Lack of access to appropriate athletic medical care at secondary schools is a significant health-care issue in the United States. ATs are often the primary caregivers to high school

athletes, so the lack of access to ATs impacts the health of these athletes. The evidence-based standards indicate that the level of athletic health care provided should be the same at all schools regardless of the financial resources available (Cooper et al., 2019).

Without access to an AT, the safety and well-being of secondary school athletes in North Carolina is impacted. For example, concussed athletes at schools with limited access to an AT are less likely to be treated according to current evidence-based recommendations (McGuine, et al., 2018), which could lead to permanent damage or death of the athlete. Lack of appropriate care increases the likelihood of re-injury (Pietrosimone, et al., 2015; Wilkerson, 2012) and long-term consequences (Manley et. al., 2017). Despite a well-documented need for ATs at secondary schools, only 35% of Title I schools in North Carolina provide access to them (Eilbacher, et al., 2015). Therefore, there is a need to demonstrate the value of ATs compared to FRs by determining the level of care being provided by each.

### **Background Literature**

In 2001 in an effort to identify the type of medical care schools and organizations should provide to secondary school athletes, the National Athletic Trainers' Association (NATA) joined forces with 16 other medical associations and sports governing bodies to form the Appropriate Medical Care of Secondary School-Aged Athletes (AMCSSAA) task force (Almquist et al., 2008). This task force developed eleven evidence-based recommendations to assist secondary schools in creating a safe environment for athletes (Almquist, et al., 2008). In 2017, the NATA Board of Directors approved the creation of a new Appropriate Medical Care Standards (AMCS) task force to revise the original guidelines to incorporate current evidence and create an online tool for schools to determine compliance with the new standards (Cooper & Peterson, 2019). The revised document, *Appropriate Medical Care Standards for Organizations Sponsoring Athletic Activity for the Secondary School Age Athlete* (ACMS), consists of 12 standards (Appendix A)

that were “identified as critical pieces for an athletics program to earn the distinction of providing appropriate medical care” (Cooper & Peterson, 2019) to ensure athlete safety and well-being.

### **Access to Health Care**

While the task force recommendations outline appropriate care, there must be access to health care in order to implement the standards. This access depends on both the availability of health-care providers and the ability of the patients to utilize their services (Levesque, et al., 2013). Patient-centered access to health care can be explained on a continuum of the dimensions of accessibility of services and the abilities of potential users to access care. These dimensions of accessibility include approachability, acceptability, availability/accommodation, affordability, and appropriateness (Levesque, et al., 2013). The abilities of potential users to access care include the ability to perceive, seek, reach, pay, and engage the health-care services (Levesque, et al., 2013). If any point on the continuum is denied, the patient will not have access to care.

**Availability of the provider.** In applying the dimensions of accessibility to the secondary school athletic setting, the most important dimension is the availability of the health-care provider. Availability of care means that the patient is able to interact with the health-care provider in a timely manner (Levesque, et al., 2013). Physical presence and location of facilities both impact the availability of a provider (Levesque, et al., 2013). Lack of access to ATs is especially true in rural areas (Pike, et al., 2017; Post, et al., 2018) and those in which there is a higher degree of poverty (Post, et al, 2018). If the AT is not available on a full-time basis, such as only providing care for football or only on campus part-time, the patient would not have the ability to engage health-care services. Although there is not a consistent definition of what constitutes a full-time AT, several recent studies defined it as one who provides care to only one school, for at least 30 hours per week, five days a week, and ten months out of the year (Huggins, et al., 2018; Scarneo, et al., 2019). This definition was used for this study as well.

**Qualification of the provider.** Another element of availability is the qualification of the provider (Levesque, et al., 2013). The North Carolina Athletic Training Licensure law requires ATs to be licensed in order to practice. As outlined previously there is a significant difference in the educational requirements of FRs and ATs. Additionally, ATs are required to work under the supervision of a physician (North Carolina General Assembly Article 34, 1997) while FRs are not, and this lack of oversight for FRs could have a significant impact on the health of the athlete.

**First responders.** Despite FRs having a lower educational requirement and no requirement for a national certification, they are permitted to function on their own and potentially perform skills for which they have no training, which could endanger the athletes under their care. Two studies on the care of secondary school athletes in North Carolina found the care to be inconsistent or lacking (Aukerman, et al., 2006; Eilbacher & Tritschler, 2004). In a study of FRs' perception of their knowledge and willingness to perform skills when necessary, they reported feeling least confident in their knowledge of head, neck, cervical spine, and low back injuries (Eilbacher, 2010). In addition, neither the years of experience nor years of continuing education credits impacted the FR's perceived knowledge (Eilbacher, 2010). This lack of perceived knowledge is concerning since both head and cervical spine injuries can result in death. FRs reported that they felt most confident in their ability to manage a heat illness, however, they were less likely to perform those skills when necessary (Eilbacher, 2010). Having more than four years of experience did have an impact on FRs willingness to perform skills related to heat illnesses and they were also more likely to manage a heat illness than they were to perform other skills (Eilbacher, 2010). FRs also reported they were less likely to perform skills related to general medical conditions (Eilbacher, 2010), which is also concerning since cardiac conditions are the leading cause of sport-related deaths (Boden, et al., 2013). Furthermore, FRs were less likely to perform skills when they did not feel as confident in them (Eilbacher, 2010).

## **Appropriate Care**

Appropriateness of care depends on both the services that are provided and the quality of those services (Levesque, et al., 2013). If the only care available is poor quality, or not based on best practices, there is a lack of access to care (Levesque, et al., 2013). The lack of appropriate health-care providers in the form of ATs at the secondary schools is a significant barrier to accessing health care. A FR does not meet the definition of an appropriate provider, and appropriate care is not being provided if an appropriate provider is not available. The socioeconomic status and rural location of the secondary schools should not determine the level of care these athletes can receive (Cooper et al., 2019).

**Athletic trainers as the appropriate providers.** Recognizing the inherent risk of injury in secondary school sports, the AMA, the NFHS, and the NATA all recommend that secondary schools employ ATs to provide appropriate care for their athletes (Almquist, et al., 2008, AMA Resolution, 1998; NFHS, 2016). The American Academy of Pediatrics (AAP) outlined the need to designate an Athletic Health Care Team (AHCT) with a team physician and AT as the primary members (Gertsen & Lopez, 1996; Harries, 1996). The AMA even recommended that medical organizations and schools work together to secure funding for an AT in all secondary schools (AMA Resolution, 1998). Further, these entities recognized the need for a team approach with the AT working under the supervision of a physician, thus allowing the AT to provide access to onsite care for prevention and treatment of minor injuries. Access to on-site care for minor injuries helps to reduce the risk of re-injury because deficiencies are recognized and addressed (Bahr & Holme, 2003; Lyznicki, et al., 1999; Shimon, 2002). In addition, prevention is cited as one of the primary responsibilities of the AT (Lyznicki et al., 1999; Prentice, 2014).

As the national governing body for secondary school athletics, the NFHS is responsible for promoting participation in secondary school sports and ensuring that athletes have a safe

environment (NFHS, 2016). In an effort to reduce injuries and enhance performance in secondary school sports, the NFHS released a consensus statement that outlines practical, evidence-based recommendations for athletes, parents, coaches and athletic administrators (Bergeron & Koester, 2016). These recommendations include an AT being present at all practices and games, not just football (NFHS, 2016). This statement is important because it directly addresses the health-care provider most appropriate for providing medical care of the athletes. With FRs able to fill the role of an AT in North Carolina, there is a need to determine if the level of care differs between ATs and FRs, as well as to identify barriers and facilitators to meeting the evidence-based guidelines.

### **Purpose and Aims**

The purpose of this research was to evaluate the level of care being provided by ATs and FRs at NCHSAA member schools based on the current best practices document, the *Appropriate Medical Care Standards for Organizations Sponsoring Athletic Activity for the Secondary School Age Athlete* (AMCS).

**Aim #1:** To determine how often ATs and FRs at NCHSAA-member schools met the standards of the AMCS.

**Aim #2:** To evaluate potential differences between FRs and ATs in meeting the elements of the AMCS standards.

**Aim #3:** To identify the barriers and facilitators to meeting the elements of the AMCS.

### **Methods**

A sequential mixed-methods study design was used to address the purpose and aims. To address aims one and two, ATs and FRs at secondary schools in North Carolina were surveyed to determine how well the school or organization for which they worked met the AMCS standards, which specific written policies were in place at the school, and what aspects of appropriate care

each person delivered personally. To address aim three, focus groups were conducted with ATs and FRs to determine the barriers to meeting the AMCS standards.

## **Participants**

After acquiring Institutional Review Board approval, participants were recruited in person, via social media, and through emails. The intended participants were current ATs or FRs at secondary schools in North Carolina.

**Survey participants.** The NCHSAA provided access to the database of ATs and FRs at NCHSAA-member schools and the NCHSAA Sports Medicine Consultant recruited participants in person at the Injury Management Clinic at the North Carolina Coaches Clinic. The North Carolina Athletic Trainers' Association (NCATA) posted a link to the survey on its website. Each AT and FR also received an email requesting their participation in the survey. A link to the survey was shared on Facebook and Twitter and emailed to personal and professional contacts for them to share with potential participants. After providing informed consent, participants completed an online survey. All participants were 21 years or older and the final sample consisted of 162: ATs ( $n = 115$ ) and FRs ( $n = 47$ ).

**Focus group participants.** Participants of the focus group were a purposeful sample from those who completed the survey and volunteered for participation in a focus group. Participants were recruited from a link at the end of the survey or by word of mouth from other participants. After giving consent, each participant participated in a semi-structured focus group. The final sample consisted of AT ( $n = 13$ ) and FR ( $n = 3$ ) participants. All of the participants were current secondary school ATs or FRs in North Carolina.

## **Measures**

**Survey.** The survey was designed based on the AMCS standards (Cooper, et al., 2019). The survey consisted of: demographic information, questions related to the AMCS standards

(Likert scale for the specific standards and yes/no for questions related to athletic training services and written policies), and knowledge questions related to the common causes of death during athletic participation. The survey was administered online through Qualtrics and piloted with high school athletic trainers from outside North Carolina to determine completion time and functionality of the questions.

**Focus groups.** After IRB approval, a pilot focus group was conducted to evaluate the questions and test the technology (WebEx). The study included five groups of ATs (N=13) and one group of FRs (N=3) were conducted. The call was made and recorded in WebEx with an iPhone as a back-up. A transcription service was used for the initial transcripts.

### **Data Analysis**

The Kruskal-Wallis test was used to compare ATs and FRs survey responses to how often the 12 standards were implemented because the responses were skewed. Frequencies and percentages were reported for ATs and FRs along with the KWH and p value for each standard. An overall sum score for the 12 standards was also calculated to determine if there was an overall difference between the care being provided at a school with an AT vs. those with a FR. Crosstabs and Chi Square analysis were used to compare ATs and FRs for available equipment, the types of AT services provided, the written policies recommended in the AMCS document, and the elements of each policy recommended by current NATA position statements.

Audio files for focus groups were transcribed using a transcription service and corrected manually. Participants were given a pseudonym to maintain their privacy. Open coding was performed using Atlas.ti to organize the codes. Codes were combined into categories, from which overarching themes emerged. Two primary strategies were implemented to increase trustworthiness. First, member checking was used by emailing the transcript to each participant and asking them to review the transcript for accuracy (Creswell & Miller, 2000; Pitney, et al.,

2019). Second, the results were evaluated with peer debriefing with two other ATs with extensive athletic training experience (Creswell & Miller, 2000; Pitney, et al., 2019).

## **Results**

### **Demographics**

The majority of the ATs (94.8%) and FRs (72.3%) reported that they were the primary person in charge of providing care for the athletes at their school. All eight regions of the NCATA and all four athletic classifications were represented. Half of the participants (50.3%,  $n=76$ ) worked in schools in rural areas and almost half of the schools (46.7%,  $n=71$ ) had 101-300 athletes. More than half of the participants (63.9%) reported having a budget of less than \$2500 per year for athletic training supplies and equipment. (Appendix B)

The majority of the FRs have additional responsibilities with teaching ( $n = 26$ ) and coaching ( $n = 16$ ) being the most common. Conversely, many of the ATs (46.1%,  $n=53$ ) have no responsibilities other than providing medical care to the student-athletes. There are also differences in which events ATs and FRs work. In all categories of events and all sports, except for non-contact away events, ATs are present at a higher percentage than FRs. (Appendix C)

**Aim #1.** There was not a statistically significant difference between the FRs and ATs with the overall sum score, but there were statistically significant differences in many individual standards (Table 1). Neither ATs nor FRs are consistently meeting Standards 7 and 11, which deal with the lifespan wellness and mental health of the athletes.

**Aim #2.** Chi Square analysis comparing AT and FR responses on elements of the standards showed several statistically significant differences (Table 2). Overall, ATs were significantly better than FRs in 19 of the 28 elements of the standards. Knowledge scores revealed differences between ATs and FRs especially with management of exertional heatstroke, cervical spine injuries, and sudden cardiac arrest (Appendix E).

Table 1. Comparison of Standard Scores between First Responders and Athletic Trainers

Standard		AA		O		S		R		N		KWH	p	
		n	%	n	%	n	%	n	%	n	%			
1	Use of NCHSAA standardized PPE form	FR	28		6		2		2		1		5.62	.018*
		AT	93		5		3		3		1			
2	Athletic healthcare facilities are safe/clean	FR	27		9		0		2		1		1.25	.264
		AT	61		36		7		2		0			
3a	Equip. used by athletes is safe/clean	FR	24		11		2		0		2		3.88	.049
		AT	48		30		24		3		1			
3b	Equip. properly fitted/maintained	FR	22		15		0		0		2		6.14	.013*
		AT	40		40		18		6		2			
3c	Personnel supervise use of equipment	FR	27		7		3		0		2		1.11	.293
		AT	62		27		13		2		2			
4	Protective materials safe and appr. applied	FR	27		6		4		1		1		.332	.565
		AT	76		20		7		2		0			
5	Use of environ. policies for safe activity	FR	30		4		4		0		1		4.32	.038*
		AT	94		9		2		0		0			
6	Educ/couns on nutrition, hydration, suppl	FR	15		7		10		6		1		.430	.512
		AT	30		43		29		3		0			
7	Use of wellness programs	FR	5		11		13		3		7		.681	.409
		AT	6		31		33		23		13			
8	Develop EAP in conj. with local EMS	FR <sup>+</sup>	25		4		4		1		3		7.60	.006**
		AT <sup>5</sup>	88		10		4		0		0			
9a	Provide on-site prevention programs	FR	20		7		6		4		2		.070	.791
		AT	47		35		21		2		0			
9b	Provide on-site recog/eval of injuries	FR	24		9		5		0		1		18.80	.001**
		AT	96		7		2		0		0			
9c	Provide on-site immediate care of injuries	FR	27		9		2		0		1		18.43	.001**
		AT	100		4		1		0		0			
9d	Make referrals to appropriate providers	FR <sup>+</sup>	18		10		5		2		2		6.82	.009**
		AT <sup>5</sup>	69		28		5		0		0			
10	Provide on-site therap. Interventions	FR <sup>+</sup>	6		12		12		2		5		21.83	.001**
		AT <sup>5</sup>	55		29		15		3		0			
11	Mgmt. plan for mental health cond.	FR <sup>+</sup>	7		7		7		8		8		.346	.556
		AT <sup>5</sup>	15		17		36		27		7			
12	Compr. athletic health care admin system	FR	17		8		4		3		5		2.38	.123
		AT <sup>5</sup>	54		28		15		4		0			

NOTE: FR=First Responder (n = 39, +n = 37), AT=Athletic Trainer (n = 105, ^n = 106, \$n = 102, #n = 101), AA = Almost Always, O = Often, S = Sometimes, R = Rarely, N = Never, \*Significant, p < 0.05 (two-tailed), \*\*Significant, p < 0.01 (two-tailed).

Table 2. Comparison of Elements of the Standards Provided by First Responders and Athletic Trainers

Elements	FR		AT		$\chi^2$
	n	%	n	%	
Require a pre-participation exam prior to participation	32	96.9%	96	100%	3.06
On-site prevention programs	32	56.3%	96	80.2%	7.20*
On-site evaluation of injuries	32	81.3%	96	99.0%	14.56*
On-site evaluation of medical conditions	32	84.4%	96	99.0%	11.42*
On-site immediate care of conditions	32	81.3%	96	99.0%	14.56*
Referrals to appropriate medical providers	32	87.5%	96	100%	12.39*
Guidelines for when/to whom to make referrals	31	51.6%	97	66.0%	2.07
On-site rehabilitation after an athlete is injured	32	37.5%	96	94.8%	50.12*
On-site rehabilitation after an athlete has surgery	32	21.9%	96	58.3%	12.76*
RTP decisions in consultation with a physician	32	65.6%	96	96.9%	24.06*
Evaluate psychological readiness to return to play	32	43.8%	96	60.4%	2.71
Use therapeutic modalities (ice, heat)	32	84.4%	95	98.9%	11.29*
Use therapeutic modalities (e-stim, ultrasound)	32	21.9%	96	63.5%	16.73*
On-site reconditioning of an athlete after injury	32	50.0%	96	87.5%	19.75*
Taught to recognize potential mental health conditions	32	46.9%	96	66.7%	3.98
Formal mechanism for referring potential mental health issues	32	12.5%	96	36.5%	6.50*
Track injury/illness trends to mitigate risk factors	32	25.0%	96	46.9%	4.73**
Educate athletes on how to meet their dietary goals	31	32.3%	95	63.2%	9.04*
Educate athletes on how to stay properly hydrated	32	93.8%	96	99.0%	2.84
Educate athletes on safety/efficacy of dietary supplements	32	37.5%	96	61.5%	5.58**
Fit protective equipment~	32	18.8%	96	26.0%	4.45
Coordinate reconditioning of protective equipment~	32	9.4%	96	3.1%	2.84
Yearly safety inspection/calibration&	32	40.6%	97	66.0%	9.73*
Signs posted in facility for proper hand washing+	32	25.0%	97	19.6%	6.57**
Established Athletic Health Care Team	23	43.5%	89	83.1%	15.34*
Formal agreement with team physician	23	43.5%	90	88.9%	23.30*
AED access within 1 min of every athletic venue	32	65.6%	97	72.2%	0.50
Require coaches to be CPR/AED certified	31	96.8%	96	97.9%	0.14

NOTE: FR= First Responder, AT=Athletic Trainer, % = percentage of n answering yes,

\*Statistically significant,  $p < 0.01$  (two-tailed). \*\* Statistically significant,  $p < 0.05$  (two-tailed).

~Included an option for “not my responsibility” (FR 50.0% for fitting, 68.8% for reconditioning; AT 59.4% for fitting, 77.1% for reconditioning)

&Included an option for “don’t have equipment that needs inspection/calibration” (FR 53.1%, AT 23.7%)

+Included an option for “don’t have a facility” (FR 28.1%, AT 11.3%)

There were significant differences between ATs and FRs in access (shared or exclusive use) to equipment (Appendix D). Other than supplemental oxygen and glucometers, which were low for both, ATs were much more likely than FRs to have access to emergency equipment and equipment for therapeutic interventions. Overall, most schools regardless of having an AT or a FR did not do a good job of having written policies (Table 3).

While 95% of the ATs reported having a written heat illness policy, only 73.5% of the FRs did (Table 3). Schools with ATs were more likely to include guidelines to cool first and transport second and use cold-water immersion as the treatment method. Neither FRs nor ATs were very likely to include the use of rectal temperature as the assessment method for heat illnesses, despite it being the gold standard. Fewer FRs (23.5%) and ATs (32.3%) reported having a written policy for cold illnesses (Table 3). More FRs reported having five of the seven important elements of the policy than did ATs. ATs were more likely to include unlimited access to fluids during activity and encourage athletes to hydrate when not thirsty. (Appendix E) More FRs and ATs reported having a written lightning policy than the other written policies (Table 3). Of the FRs and ATs who reported having a written lightning policy, almost all reported using the 30-minute rule for suspension of activity and nearly as many specified that activity would be suspended either with seeing lightning or hearing thunder. Of the 11 essential elements for the EAP, a higher percentage of ATs included the elements than FRs. The percentage of ATs and FRs who developed the EAP in conjunction with local EMS, school public safety officers, and school administration was relatively low. Very few FRs or ATs reported having a mental health policy at their school (Table 3). Of the FRs with a written mental health policy, 100% included five of the seven recommendations. (Appendix E)

Table 3. Comparison of Written Policies at Schools with First Responders and Athletic Trainers

Written Policy	First Responders				Athletic Trainers				$\chi^2$
	<i>n</i>	Y	N	NS	<i>n</i>	Y	N	NS	
Policy manual	15	9	6	+	86	66	20	+	1.87
Heat illness policy	34	25	5	4	100	95	3	2	12.53*
Cold illness policy	34	8	14	12	99	32	50	17	4.92
Lightning policy	33	31	3	0	98	97	1	0	5.23
Emergency action plan	33	30	1	2	98	97	0	1	5.87
Mental health policy	16	3	13	0	62	17	45	0	0.50
Scheduled cleaning (AT facility)	34	11	15	8	100	36	52	12	2.67
Scheduled cleaning (equipment)	34	13	12	9	100	22	51	27	3.89
Proper cleaning (AT facility)	34	12	15	7	100	42	45	13	1.27
Proper cleaning (equipment)	34	16	10	8	100	29	47	24	4.31
Exposure control plan	34	22	8	4	100	76	18	6	1.97

NOTE: Y=school has the written policy, N=school does not have the written policy, NS = the participant was not sure if the school had a written policy, +Yes/no question, \*Significant at  $p<.01$ , two-tailed

**Aim #3.** Appendix F summarizes the focus group participants’ gender, years of experience, and employment situations. Codes were collapsed by grouping similar codes together under new headings and coding was refined until 4 main themes emerged for barriers and 2 main themes for facilitators. Only themes with comments by a majority of participants were included. The codes were grouped into categories based on common elements. Two categories were identified as both barriers and facilitators to meeting the AMCS standards: personal and organizational. Personal characteristics were comments related specifically to the individual, such as lack of knowledge, which was especially true for FRs. Two of the three FRs spoke about their limited knowledge to perform on-site care, and specifically mentioned that they do not do any type of rehabilitation. They both discussed how they refer athletes to a physician and then do not typically see them again until they are cleared by the physician. They also talked about how hard it is to get people to serve as the FR. One FR said the other FR at his school “... actually told me the other day that he won't be doing this again next year, because it's too stressful for him to do something that he does not have a grasp on based on not having a medical background.” Another

FRs reported that “the reason I became first responder is because somebody quit and they had no other options.” The ATs also talked about the lack of knowledge of the FRs, such as “I trust mine to call 911 and do CPR, nothing else.”

The organizational barriers to implementing the standards were a lack of support, resources, and time. These barriers arose from conditions within the organization such as the structure of their position, policies or resources, or levels of support from coaches and administrators. The ATs consistently discussed the challenges of being the only provider for all of the student-athletes and how their other responsibilities made it harder to meet all of the standards: “the only thing that prevents me from rehab is the time restraint.” Another AT works in a Physical Therapy clinic in the morning and covers the high school and middle school in the afternoons. He said, “I think the biggest thing with my position is being between a high school and a middle school...it'd be really beneficial if I didn't have to be in PT clinic...it would be nice if I could have an assistant [athletic] trainer that covered the middle school...that way I don't have to be at every place at once.”

Many participants reported a lack of resources. One AT said “resources will be my number one limitation. It's not necessarily just funds but also the limitations of space.” Most of the ATs agreed that on-site post-surgical rehabilitation was difficult. According to one “because of my limited space and I don't have really modalities, I have a few ankle weights and stuff like that, so there's only a limited stuff that I can even do in my training room area for someone who's pre-surgical or post-surgical.” The volunteer FR talked about not having basic supplies. He said “...they [the school personnel] don't really think too much about having a good medical bag set up.” He donates most of the supplies he uses from the Physical Therapy clinic he owns.

Lack of support was the third institutional barrier to meeting the standards. One AT talked about how a colleague quit halfway through the football season because of the lack of

support she faced at her school. She told him the “coaches wouldn't listen to me, they wouldn't listen to my recommendations? The administration wouldn't listen to me. I got tired of it, so I went and found somewhere that would listen.” Another AT talked about how she had to pay someone to cover a game for her when she got sick. This AT also teaches three different science classes, tutors during her lunch period, and has morning administrative duties. A third AT said she “was pregnant seven months pregnant with my second child. It was...preseason football...I had pneumonia with 103° temperature, coughing my lungs out and the options were my football team not practice...or I come to practice...I drove my car to the football field, and I sat in my car with the air conditioner running, and that's how I monitored practice that day.”

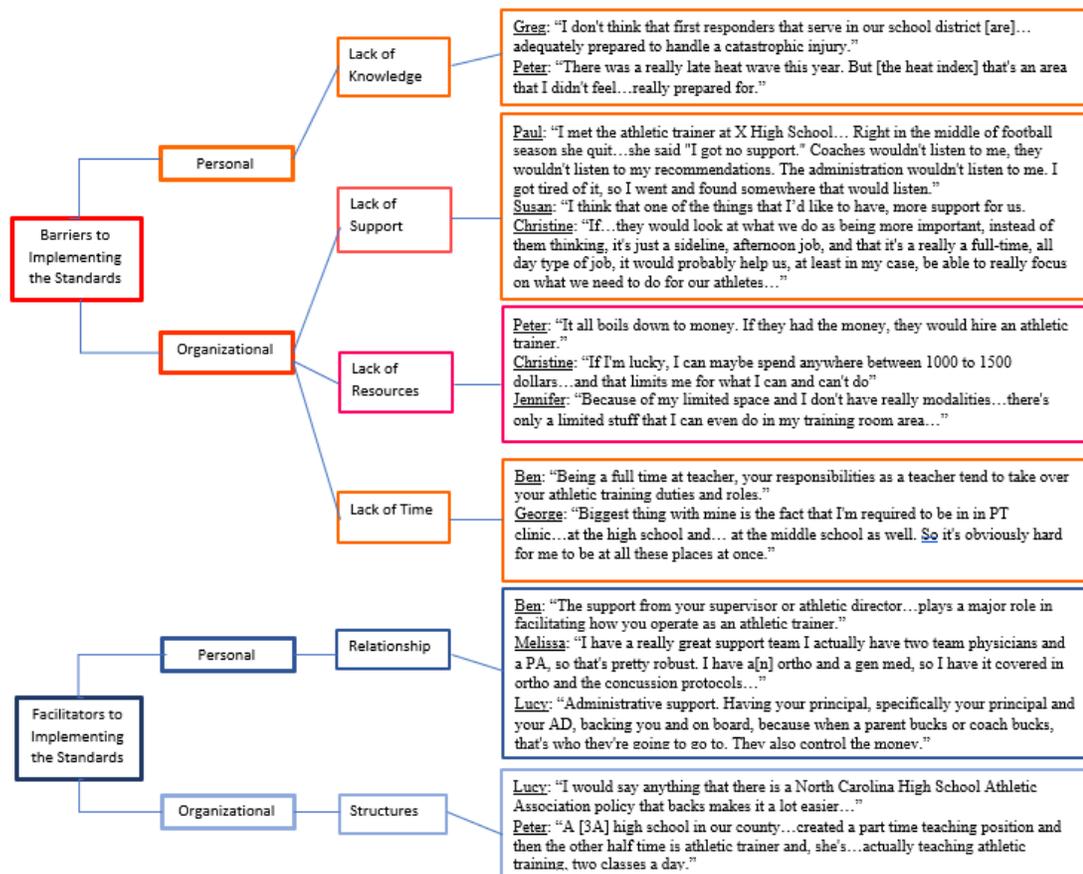
The personal facilitator to meeting the standards was relationships between the athletic trainer and stakeholders such as the coaches, athletic director, and principal. Several noted that the relationships with the football coach and athletic director were critical to their success: “just those two people, just those two people alone.” Another added “I also feel like your relationship with your coaches help facilitate on what you can and can't do.” Another AT said “I think, one of the biggest things is having a supportive athletic director and having a good relationship with them. We're able to get all the resources that we need, and I'm able to buy supplies that I need and want.” The team physician was also cited as being an important relationship to have.

The organizational facilitator to meeting the standards was the structures in place. Structures included the athletic trainer's position, such as having teaching responsibilities or clinic duties, NCHSAA rules or school policies, or structures within the county. One AT has “...late arrival so I come in later in the day.” Another talked about how her clinic understands the need to structure the AT positions so they do not burn out. Support structures are also important as one AT mentioned “...we have a really good network. We have 10 high schools in my area that we all cover through the hospital, so we work as a group.” Several participants also discussed

how the NCHSAA rules helped support them. One AT mentioned that “I would say anything that there is a North Carolina High School Athletic Association policy that backs [it] makes it a lot easier because my coaches, my ADs, my principals, they understand fines and ineligible players and having to forfeit contests due to ineligible players.”

Figure 1 demonstrates the thematic groupings created from the coding and (Appendix F) includes specific quotations for each theme.

Figure 1. Thematic Groupings Derived from Coding Focus Group Data



## **Discussion and Implications**

The NCHSAA requires schools to have either an AT or FR present at all football practices, home and away games and home wrestling events (2019). Given that many more FRs than ATs had responsibilities other than providing care to the athletes, it is not surprising that ATs covered more events compared to FRs. The percentage of FRs who were present at football and wrestling was not 100% although the NCHSAA requires them to be present for those sports. In addition, one of the FRs reported being the primary provider at their school while also serving as a football coach, which is against the NCHSAA (2019) and NCAC policies (2019). One of the ATs in the focus group pointed out that since FRs are not educated as health care providers, their allegiance would be to a coach instead of an injured athlete. This would be especially true if the FR is also part of the coaching staff. Further, when no provider is present at a practice or game, injured athletes are much less likely to receive appropriate care (Post, et al., 2018). Because FRs are not considered appropriate providers (Levesque, et al., 2013), athletes have less access to care and there is a greater risk to the athletes at those schools (Post, et al., 2018).

Given that many schools only have one provider, it was surprising that the percentage of ATs providing care at non-contact events was as high as it was. The risk of injury is higher with contact sports, so the high percentage of ATs covering other contact sports in addition to football and wrestling makes sense. The percentage of FRs covering non-contact sports being higher than the percentage of FRs covering other contact sports was surprising since the level of risk of injury is lower with non-contact sports. Quite a few FRs reported coaching duties in non-contact sports which might account for those differences. Several of the FRs were also multi-sport coaches, which would have a significant impact on the practices and games they could attend. Given that FRs were often also coaches, it is not surprising that they attended away events for non-contact

sports at a higher rate than ATs did. It is likely that despite a NCHSAA rule specifying that a FR must not have concurrent coaching duties (2019), many provide care to teams they are coaching.

Because FRs have limited to no training specific to on-site prevention, evaluation, management, and rehabilitation of injuries, it is not surprising that ATs perform those services more often than FRs. These results were consistent with previous research findings that ATs were most likely to spend time evaluating and reevaluating injuries and using therapeutic interventions such as heat and cold, and slightly less likely to devote time to other therapeutic interventions (Kerr, et al., 2015; Lam, et al., 2015; Valovich McLeod, et al., 2012). ATs in the focus groups reported they did not have the time, space and equipment to carry out rehabilitation plans based on best practices, which is in line with previous research.

Most injuries treated by secondary school ATs are non-time-loss, meaning that the athlete is able to continue to practice and play in games (Dompier, et al., 2015). On-site care for minor injuries helps reduce the risk of reinjury because deficiencies are recognized and addressed (Bahr & Holme, 2003; Lyznicki, et al., 1999; Shimon, 2002; Weaver, et al., 2002). In high schools without ATs, the reinjury rate was significantly higher (LaBella, et al. 2012). Athletes sustaining reinjury are more likely to discontinue sport participation and require surgical intervention than those with new injuries (Welton, et. al., 2018). Reported low adherence to standard 7 (wellness across the lifespan) highlights this potential for lifelong impacts from failing to protect the athletes from long-term consequences (Friery & Bishop, 2007; Simon et al., 2019).

Most important, FRs are less likely to have access to emergency equipment and supplies for the prevention and rehabilitation of injuries, coupled with the fact that they are less likely to work with EMS to create their Emergency Action Plans demonstrates that they are not as capable of responding to emergencies as ATs. Also, not all of the FRs knew if they had written policies, despite being responsible for implementing any written policies related to the health and safety of

athletes. The NCHSAA requires schools to have a heat illness policy, lightning policy, and emergency action plan. FRs were also less likely than ATs to have a designated AHCT, a formal arrangement with a physician, and make return to play decisions in conjunction with a physician. Compounding these concerns is the lack of knowledge of appropriate management of exertional heatstroke or a potential cervical spine injury. When coupled with their lower educational and professional developmental requirements and the likelihood of mismanagement significantly increases.

Several limitations to this study might have an impact on the results. First, the sample size of FRs for the focus groups was small. Second, some of the elements of the new standards were not assessed because the full document was not available before the survey began. Finally, only two researchers were used to independently code the focus group themes. Creswell and Miller (2000) recommend three separate people to code for multiple-analyst triangulation as a method for increasing the trustworthiness of the data.

Despite the limitations, enough evidence is available to demonstrate a difference in care being provided by ATs and FRs which will have an impact on student-athlete wellness and safety. Educating administrators and parents and athletes about the differences in care between ATs and FRs could lead to policy changes. In addition, ATs could be educated about the AMCS document and areas in which they could perform better. These changes could lead to an improved level of care for secondary school athletes in North Carolina. The results of this study could be used by ATs in other states to raise awareness of the AMCS standards and could be used to evaluate the level of care by ATs in other states as well.

## CHAPTER II

### DISSEMINATION

An overview of the Appropriate Medical Care Standards and the research findings were presented on March 8, 2020 at the North Carolina Athletic Trainers Association Meeting in Wilmington, NC. The presentation was an hour and it was attended by licensed athletic trainers, many of whom are currently working in the high school setting. The goals of this presentation were to 1) provide an overview of the Appropriate Medical Care Standards document, 2) describe appropriate medical care for the secondary school athlete, 3) compare North Carolina athletic trainers (ATs) and first responders (FRs) related to the standards, and 4) identify standards that are being met well and areas in which there is room for improvement. By identifying potential gaps in care and offering solutions that lead to improved access/care in underserved areas, it is possible for this work to impact the medical care of secondary school athletes in North Carolina.

There were questions at the end to clarify some of the results presented and positive feedback was offered regarding the usefulness of the information. Several athletic trainers spoke to me after the presentation with specific follow-up questions. Following the presentation, the sports medicine liaison to the NCHSAA asked me to present at the Health and Safety Summit they were planning to host in November. I also met with two of the officers of the NCATA following the meeting to discuss a potential partnership for further research.

#### **Presentation Script**

My name is Susan Edkins, and I'm a doctoral candidate at UNCG in the EdD in Kinesiology program, and my presentation is called Appropriate Medical Care for Secondary School Athletes in North Carolina. (Slide 1)

My objectives with this presentation are to provide an overview of the evolution of the appropriate care standards, describe appropriate medical care for the secondary school athlete, compare North Carolina ATs and FRs related to their performance on the standard, and identify standards that are being met well and areas in which there is room for improvement. (Slide 2)

The current document, *Appropriate Medical Care Standards for Organizations Sponsoring Athletic Activity for Secondary School Aged Athletes*, was published in March 2019. This document is a revision of the 2005 guidelines that established what appropriate care entailed. The NATA assembled an interdisciplinary task force, which spent two years incorporating new research and revising the guidelines. The resulting document increased from 11 guidelines to 12 standards. Also, each standard has sub-standards to outline how to meet the standard, including appropriate supporting documentation. Another difference is that the standards also include relevant case law. The taskforce also created the Program Assessment for Safety and Sport (PASS), which is an online tool that's available for schools to use to measure the level of care that they are providing. That tool is available on the National Athletic Trainers Association website. (Slide 3 and 4)

I administered a survey to North Carolina ATs and FRs using a Likert scale for questions for each standard, yes/no questions for equipment, written policies, and sub-standards, and all that apply questions for elements of policies and knowledge questions. I also did follow up focus groups with ATs and FRs looking at the barriers and facilitators to meeting specific standards. (Slide 5)

I have a handout with more specific information about the sub-standards, but I will go through each standard and then my results. [Read Standard 1] The sub-standards include making sure that the PPE is performed by a physician, that there is a comprehensive medical history that

is completed by both the parent and the athlete, and that there are questions related to mental health. In North Carolina, we have a standardized PPE form that was created by the North Carolina High School Athletic Association. Other sub-standards include having a management plan to address any deficiencies or conditions that need a management plan, such as asthma or diabetes. There's also a sub-standard related to education and one that's related to ensuring that there is parental permission to release information to the coaches. (Slide 6, 7 and 8)

I found that 100% of the ATs and 96.9% of FRs are requiring a PPE prior to participation. Use of the NCHSAA form was statistically greater for ATs than FRs. Both ATs and FRs reported this standard was easy to meet and having the NCHSAA form was beneficial. It was also reported that some companies provide free comprehensive physicals to their student athletes, which was seen as a facilitator to meeting this standard. Read standard 2. (Slide 9 and 10).

This visual gives you an overview of the sub-standards, which include having written policies related to disinfection and sanitizing facilities, equipment, including hydration equipment, and locker rooms. It also involves ensuring there is an exposure control plan in place. (Slide 11)

This is a standard where we could do better. FRs were statistically significantly more likely to have signs posted for proper hand washing. 66.1% of ATs do have a written exposure control plan though, whereas only 46.8% of FRs do. More ATs have written policies related to cleaning the athletic training facility than equipment, but the percentages are still low. Read standard 3. (Slide 12, 13, and 14).

The sub-standards address things such as ensuring that the people who are fitting the equipment are properly educated, having a policy of who will be fitting the equipment and

reconditioning of equipment, making sure that coaches are properly trained to teach skills, and also making sure that any athletes that are using equipment are being supervised. (Slide 15)

Most of the ATs and FRs reported it was not their responsibility to properly fit the equipment. The ATs did report though, that they have to fix problems for improperly fitting equipment regularly. 75% of the FRs reported having formal training and how to properly fit protective equipment, but 81% also reported that it wasn't their responsibility. Another part of meeting this standard is ensuring that the coach is competent. Usually that's going to fall on the AD, but that's a conversation that you need to have if you are evaluating the care being provided. Read standard 4. (Slide 16 and 17)

This sub-standard requires that there's a qualified medical practitioner, or QMP. An AT obviously would be a qualified medical practitioner, but if you have a FR, then you have to verify and document appropriate training for the specific type of protective equipment being used. (Slide 18)

87.5% of FRs reported having formal training in how to apply protective taping and bracing. What I did not ask is what constituted formal training? Who did that training? How was it documented? How often does it occur? Read standard 5. (Slide 19 and 20)

The sub-standards for this standard are written policies for the common environmental conditions. These policies should be reviewed by the AHCT and their needs to be an educational component. (Slide 21)

I found significant differences between ATs and FRs with the heat illness policies. Only 73.5% of FRs reported having a written heat illness policy, despite the fact that it is an NCHSAA requirement. 11.8% of FRs were also unsure of whether they had a written heat illness policy,

which is concerning considering they are responsible for implementing the policy. Neither ATs nor FRs did a good job of having a written cold illness policy. Only 32.3% of ATs and 23.5% of FRs had a cold illness policy, so that's an area of growth as well. For each written policy, if the athletic trainer or first responder reported they had that policy, I then asked them questions related to what elements were included in the policy. (Slide 22)

Only 72% of the FRs compared to 95.8% of ATs had guidelines to cool first and transport second. The requirement for use of rectal temperature, which is the gold standard for determining core temperature, is another area that we can improve. Only 45.3% of ATs and 32% of FRs reported having a requirement to use rectal temperature in their written policy. Only 84% of FRs while 92.6% of ATs reported using cold water immersion as a management technique for exertional heat stroke. (Slide 23)

With the cold illness policies FRs included five of the seven important elements more often than ATs did. Those elements included identifying participants at a higher risk, using windchill temperature to determine practice modifications, provision of supplies for active rewarming, use of rectal temperature to monitor core temperature, and a plan to initiate rapid transport when required. ATs were more likely to include unlimited access to fluids and encourage athletes to hydrate when not thirsty. (Slide 24)

ATs were more likely than FRs to include all of the important elements of lightning policies based on the current position statements. Only 83.9% of FRs included a designated safe space for each team while 99% of ATs did. 87.1% of FRs and 97.9% of ATs use a lightning detection device or mobile phone app. Read standard 6. (Slide 25 and 26)

Sub-standards for this one included educating and counseling athletes on their overall diet, hydration, and use of dietary supplements. ATs were significantly more likely than FRs to

educate athletes on how to meet dietary goals and educate athletes on safety or efficacy of dietary supplements. Both ATs and FRs did a good job of educating athletes on hydration. Read standard 7. (Slide 27, 28 and 29)

The sub-standards included having a written policy for evaluating elements of fitness, having parental consent to do that assessment looking for ways to lessen the likelihood of athletes having long term consequences of their injuries. (Slide 30)

ATs reported the lowest level of compliance with this standard. It was slightly lower than FRs actually. ATs in the focus group stated that this standard was outside their scope. I think that for this standard we could identify community resources and create partnerships, because another issue was the ATs reported having a lack of time to implement some of these standards. I think we look at it from the opportunity to have an impact on public health. Read standard 8. (Slide 31 and 32)

This visual shows the elements of this standard including defined roles, a written policy, and we need to critically review an incident and implement quality improvement strategies when an event happens. We also need to evaluate communication, have a list of the emergency personnel, identify an assigned advocate for the athlete if their parent is not available. The EAP needs to be venue specific and it needs to be reviewed annually with anyone that may need to implement it as well as the AHCT. (Slide 33)

ATs were significantly more likely than FRs to have access to all emergency equipment except glucometers and supplemental oxygen. They also are more likely to have developed their emergency action plan in conjunction with local EMS. AED access within one minute was relatively low for both, with 72.2% of ATs and only 65.6% of FRs reporting that they had AED access within one minute of every venue on their campus. If the FRs are not as likely to have

access to equipment as well as likely having less training, there is an increased potential negative outcome. Read standard 9. (Slide 34 and 35)

One of the sub-standards was having a QMP on-site based on the risk and rate of injury and illness. One of the ways to document compliance with this sub-standard was having a published calendar of the QMP assignments and evidence of administrator approval. Another sub-standard was having a sudden death and sports management plan that was annually reviewed by the AHCT and having a QI plan in place. (Slide 36)

ATs are significantly more likely than FRs to provide the following services on-site: prevention programs, evaluation and immediate care of injuries and medical conditions. ATs are also more likely to track injury and illness trends and mitigate risk factors, but the percentages are still low. Only 46.9% of ATs and 25% of FRs are tracking illness trends, and this is something that is another opportunity as well. I will talk about that later. Only 66% of ATs and 51.6% of FRs had guidelines for when and to whom to refer an injured athlete. Read standard 10. (Slide 37 and 38)

The sub-standards include things such as having appropriate equipment and sufficient space for on-site therapeutic interventions, and having access to educational materials that can be used with the athletes relative to their plan of care. (Slide 39)

There were significant differences between ATs and FRs related to on-site rehabilitation after an athlete is injured and after they have surgery, on-site reconditioning of an athlete after injury, and RTP decisions being made in consultation with the physician. ATs reported they don't have the equipment, space, and time to be able to appropriately rehabilitate someone who's had a surgical intervention and the survey results supported that with 58.3% of ATs doing post-surgical rehab compared to 94.8% doing rehab after an injury. They also reported having access to a clinic

where the athletes could get better post-surgical interventions. Neither ATs nor FRs are doing a good job of evaluating psychological readiness to RTP with only 60.4% of ATs and 43.8% of FRs reporting that they address psychological readiness to return. This point leads us to the next standard which is related to mental health. Read standard 11. (Slide 40, 41, and 42)

The sub-standards included making sure that people are educated about identifying mental health conditions and that they are educating athletes about mental health conditions and relaxation techniques. It also includes having an emergency plan for handling a significant mental health condition that is developed with mental health professionals and ensuring connections to mental health professionals for athletes that need a referral for counseling. (Slide 43)

Standard 11 is another area for improvement. Only 17 ATs and 3 FRs reported having a written plan for managing mental health conditions. However, the mental health plans they FRs described were more comprehensive than those described by ATs. One AT reported working with community resources to create a plan and network and I think that that's an area of potential for others. A model program could be developed and replicated by others. Read standard 12. (Slide 44 and 45)

These sub-standards related to the creation of the AHCT, having a formal agreement with a team physician, documenting appropriately and using that information to prevent injuries. It also includes ensuring that you have enough staffing and a sufficient budget, so this standard is very comprehensive. (Slide 46)

For this standard I asked what sports or events the ATs and FRs attended. ATs were on-site for everything at a higher rate than FRs, with the exception of non-contact away events. I think that was most likely because quite a few of the FRs reported having coaching

responsibilities, especially with non-contact sports. I think they were probably counting being at their own events, even though the NCAC specifies that a FR cannot have concurrent coaching responsibilities. The NCHSAA requires the AT or FR to be present for all football practices and games both home and away, and all wrestling home matches. The percentages, especially of the wrestling home matches are relatively low, with only 53.2% of FRs and 87% of the ATs reporting being on-site for the wrestling home events. (Slide 47)

ATs are significantly more likely than FRs to have an established AHCT, a formal agreement with a team physician, make RTP decisions in conjunction with the physician, make referrals to appropriate medical providers and to ensure the yearly maintenance and calibration of equipment. If we look at the fact FRs generally have little or no formal education related to on-site evaluation and therapeutic interventions and that they are less likely to have a formal agreement with a medical director, or any kind of an athletic healthcare team, that means that they are less knowledgeable, but they are operating more independently than ATs are allowed to operate, so that is a concern. (Slide 48)

In general, ATs and FRs reported challenges to meeting the standards related to a lack of time, space and resources. The facilitators they reported were support, specifically from the athletic director and the football coach and many of them said if you have the support of those two individuals, your job will be much easier. The other thing that was reported was anything for which there was a NCHSAA rule or a form was much easier for them to implement. (Slide 49)

What are your next steps? First, you could use the online pass tool on the NATA website to evaluate your program. It is not something that is going to be a quick thing to do as it is recommended to complete one standard per month over the course of year. With Standard 7 related to wellness programs, I think we have some opportunities here. We could look at utilizing

or advocating for coaches who are CSCS to help out with this one. Maybe also bringing in guest speakers to address performance enhancing drugs. You could also consider adding a registered dietician to the AHCT. This is also a place where we really need to think about this from a public health perspective. If we are not doing proper rehabilitation when athletes are injured in high school, they are going to have long-term consequences of those injuries that are going to impact both their physical activity levels and their health-related quality of life later on. (Slide 50)

Standard 11 related to mental health is another area of potential growth. We really need to think about utilizing our community and school resources. I think you should consider adding a mental health professional to be on the athletic healthcare team. If you do not already have a written plan, I strongly suggest that you look at developing a plan for handling a mental health crisis. This plan needs to be developed in conjunction with mental health professionals. Another thing that would be fairly easy to implement would be providing a stress management workshop or if you have a social media account for your program, you can provide tips through social media. The other area that I think we really could do a better job of is tracking injuries and illnesses and the services we are providing. That data can be used to help implement prevention programs, but even more importantly, it can be used to demonstrate your value and advocate for additional human resources. Given that lack of time and human resources were reported as being barriers to implementing the standards, having additional human capital would be very beneficial. (Slide 51)

References, acknowledgements and thank you. (Slide 52, 53, and 54)

## CHAPTER III

### ACTION PLAN

This plan will focus on educating the public about the value of athletic trainers (ATs) and educating high school ATs awareness of the elements of the *Appropriate Medical Care Standards for Organizations Sponsoring Athletic Activity for the Secondary School Age Athlete* (AMCS) document and the Program Assessment for Safety in Sport (PASS) tool on the National Athletic Trainers' Association (NATA) website. Athletic directors, principals, superintendents, and school board members are the policy and decision makers, so it is important to educate them about potential gaps in care that could result in the injury or death of their student-athletes. Educating current and future high school ATs in North Carolina will promote improvements in the quality of athletic health care for secondary school athletes.

#### **Short Term Goals**

My immediate goal is to disseminate my research findings as broadly as possible. This dissemination will focus on both athletic trainers, because the standards are new, and the public, because the stakeholders for high school athletics need to understand the value of access to an athletic trainer.

The dissemination to athletic trainers started with a presentation of my findings at the North Carolina Athletic Trainers' Association (NCATA) annual symposium on March 8, 2020. In this presentation I provided information to ATs about the current best practices with the AMCS document and the PASS self-evaluation tool. Using my results, I highlighted potential gaps in care that can have a positive impact on the level of care provided to secondary school athletes in

the future. The Sports Medicine Consultant to the North Carolina High School Athletic Association (NCHSAA) was in attendance for this presentation. He is planning to report about the presentation to the Sports Medicine Advisory Committee (SMAC) of the NCHSA. I am also presenting a short video of my findings at the Mid-Atlantic Athletic Trainers' Association meeting in May. This presentation will focus on the barriers and facilitators for meeting the standards since the issues raised by ATs in North Carolina will resonate with ATs in the other states in this region.

The immediate goals for dissemination to the public include two presentations. I have been asked to present about appropriate medical care for high school athletes at the Health and Safety Summit that is being planned by the NCHSAA. The purpose of this summit is to educate legislators and key members of the public about the value of having access to an athletic trainer at every high school. I was also approved to speak locally at the Health and Wellness Symposium at the University of North Carolina at Pembroke (UNCP) in March. The symposium was cancelled due to COVID-19, but there are plans to reschedule it for October. This symposium brings together health professionals both on and off campus and community members who have a vested interest in the health of our communities. While Robeson County, in which UNCP is located, has ATs at every high school, several of the surrounding counties such as Bladen, Columbus and Cumberland have very few high schools with access to ATs. Presenting at this symposium could give me connections to people in these communities who could connect me with policy and decision makers.

### **Long Term Goals**

My long-term plans also focus on raising awareness about the value of athletic trainers with the public, but the long-term goal for athletic trainers will be broader. The efforts related to the public will focus on educating parents about athletic trainers and getting involved at the state

level to promote athletic training. My efforts specific to athletic trainers will focus on education about the AMCS specifically and also will involve providing continuing educational opportunities to ATs who have been certified prior to the 2020 educational standards being released.

One strategy to educate parents of high school athletes is to record a podcast from my perspective as a parent of former high school athletes who were injured while participating in sports. The goal will be to keep the podcast to ten to fifteen minutes in length and involve other parents if possible. The podcast can highlight the benefits of the AT in the recovery process and highlight differences for athletes who do not have access to that type of care.

I will also seek to be appointed to the SMAC of the NCHSAA. Being a member of the SMAC would allow me to be involved in the state level conversations that are occurring related to the health and safety of student athletes in North Carolina. I would also like to partner with the NCHSAA Sports Medicine Consultant to conduct more research that will help to increase access to ATs. This partnership can help to promote the strategic goals of the NCHSAA while allowing me to continue the research line I have started.

I will also seek to get involved with the Governmental Affairs Committee of the NCATA which would lead to interacting with Superintendents and School Board members from across the state. The Governmental Affairs Committee (GAC) advocates for ATs by attending the state meetings of Superintendents. Each year the GAC invites several ATs to attend the meeting to advocate for each school providing access to an AT. My participation in the NCATA Leadership Institute for the past year will pave the way for me to gain access to a leadership position with the NCATA because the coordinator of the institute also serves as co-chair of the GAC.

The implementation of new CAATE educational standards in July 2020 brings an opportunity to provide continuing education to ATs with respect to the new content. Any time

there is a change in the educational standards, ATs who are already certified need to have access to the new content. This new content presents an opportunity for ATs to play a more active role in public health. This opportunity is especially important for ATs who work in rural and lower socioeconomic areas, where the access to healthcare is even lower. Embracing this role as ATs will improve the health of all communities as we seek unique ways to partner with other organizations in order to promote the health and wellness across the lifespan. As an educator of ATs in one of the state institutions in North Carolina, I can seek partnerships with other AT across the state to provide access to low cost or free continuing education related to health and wellness across the lifespan.

Another strategy for educating currently practicing ATs is to provide a monthly education series for NCATA members related to the AMCS document. This education series could span a year and provide education to one standard per month. The education would focus on the standard and sub-standards and the ways in which the AT can demonstrate compliance with the standard. Providing ATs with the tools they need to increase the level of care they provide will benefit athletes across the state. It might even be possible to partner with the NCATA to provide continuing education units to ATs who complete the education each month.

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## APPENDIX A

### AMCS STANDARDS

#### *Appropriate Medical Care Standards for Organizations Sponsoring Athletic Activity for the Secondary School Age Athlete Standards*

Standard 1: Athletes' readiness to participate in activity is determined through a standardized pre-participation physical examination (PPE) screening process.

Standard 2: Practice, competition and athletic health care facilities as well as equipment used by athletes are safe and clean.

Standard 3: Equipment worn by athletes is properly fitted and maintained while instructions to use safely and appropriately are provided.

Standard 4: Protective materials and products used to prevent athletic injuries are safely and appropriately applied.

Standard 5: Athletic participation in a safe environment is ensured or activity is modified or canceled based on established environmental policies.

Standard 6: Education and counseling is provided for athletes on nutrition, hydration and dietary supplementation.

Standard 7: Wellness programs promote a safe progression of physical fitness and improve long-term health across an athlete's lifespan.

Standard 8: Comprehensive athletic emergency action plan (EAP) is established and integrated with local EMS per athletic venue.

Standard 9: On-site prevention, recognition, evaluation and immediate care of athletic injuries and illnesses are provided with appropriate medical referrals.

Standard 10: On-site therapeutic intervention (pre-, post-, and non-surgical conditions) outcomes are optimized by developing, evaluating and updating a plan of care for athletes.

Standard 11: Comprehensive management plan for at-risk athletes with psychological concerns.

Standard 12: Comprehensive athletic health care administration system is established to ensure appropriate medical care is provided. (National Athletic Trainers' Association, 2019, p. 11)

APPENDIX B

DEMOGRAPHIC INFORMATION

Athletic Trainer and First Responder Participants by Region of the State

<b>Region</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>Missing</b>
AT	4	10	8	11	24	29	8	13	0
FR	2	5	7	8	14	1	6	0	4
Total	6	15	15	19	38	30	14	13	4

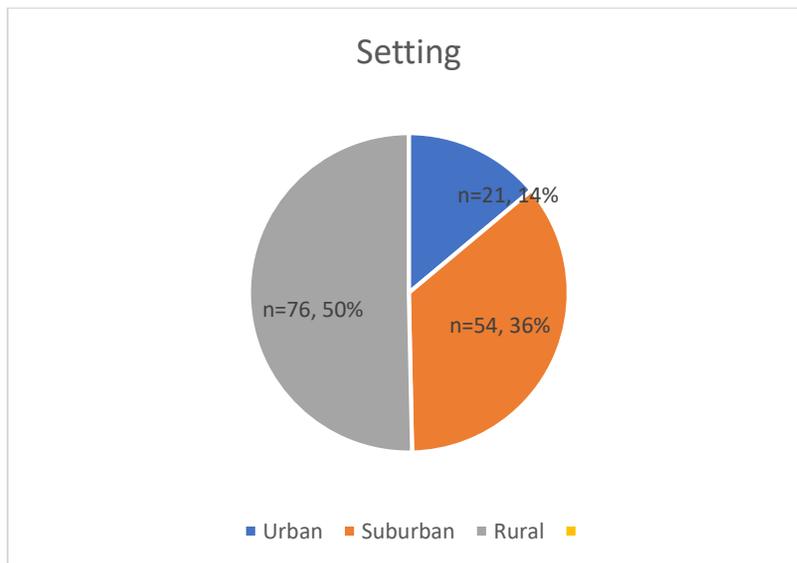
Note: AT  $n = 107$ , FR  $n = 47$

Athletic Trainer and First Responder Participants by Athletic Classification

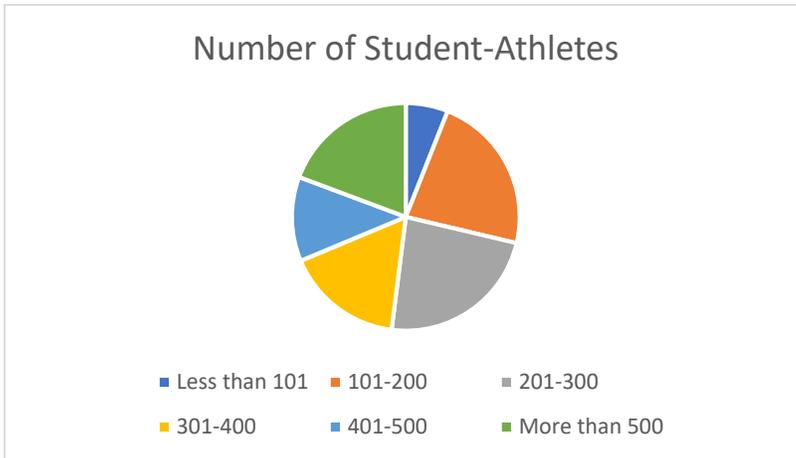
<b>Classification</b>	<b>1A</b>	<b>2A</b>	<b>3A</b>	<b>4A</b>	<b>Unsure/Missing</b>
AT	20 (17.5%)	31 (27.2%)	31 (27.2%)	25 (21.9%)	6 (6.1%)
FR	17 (36.2%)	9 (19.1%)	13 (27.7%)	3 (6.4%)	5 (10.6%)
Total	36 (22.5%)	41 (25.6%)	44 (27.5%)	28 (17.5%)	11 (6.9%)

Note: AT  $n = 113$ , FR  $n = 47$

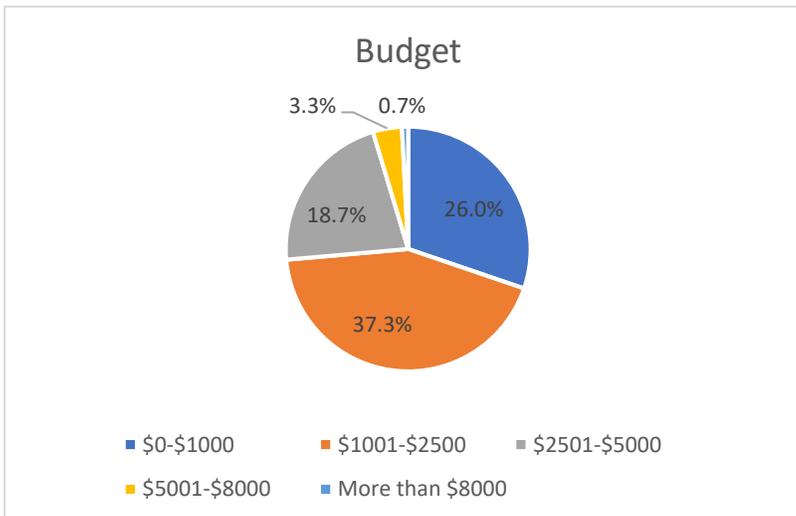
Setting of Participant's Schools



### Number of Student-Athletes



### Approximate yearly budget for athletic training supplies and equipment



APPENDIX C

EVENT COVERAGE AND ADDITIONAL RESPONSIBILITIES

Comparison of Practices Covered by Athletic Trainers and First Responders

<b>Provider</b>	<b>Football</b>	<b>Wrestling</b>	<b>Other Contact Sports</b>	<b>Other Non-Contact Sports</b>
AT	93.0%	73.9%	80.0%	78.3%
FR	68.1%	21.3%	21.3%	23.4%

Note: AT  $n = 115$ , FR  $n = 47$

Comparison of Home Events Covered by Athletic Trainers and First Responders

<b>Provider</b>	<b>Football</b>	<b>Wrestling</b>	<b>Other Contact Sports</b>	<b>Other Non-Contact Sports</b>
AT	93.0%	87.0%	92.2%	88.7%
FR	70.2%	53.2%	48.9%	57.4%

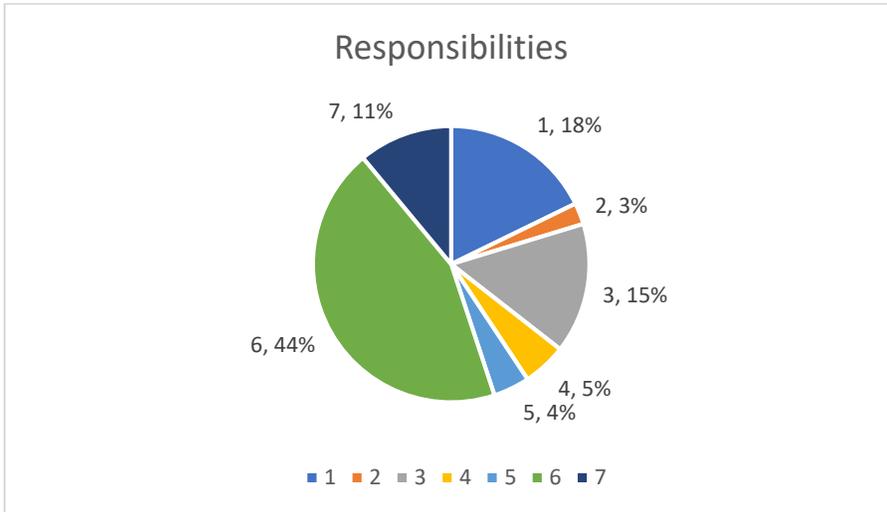
Note: AT  $n = 115$ , FR  $n = 47$

Comparison of Away Events Covered by Athletic Trainers and First Responders

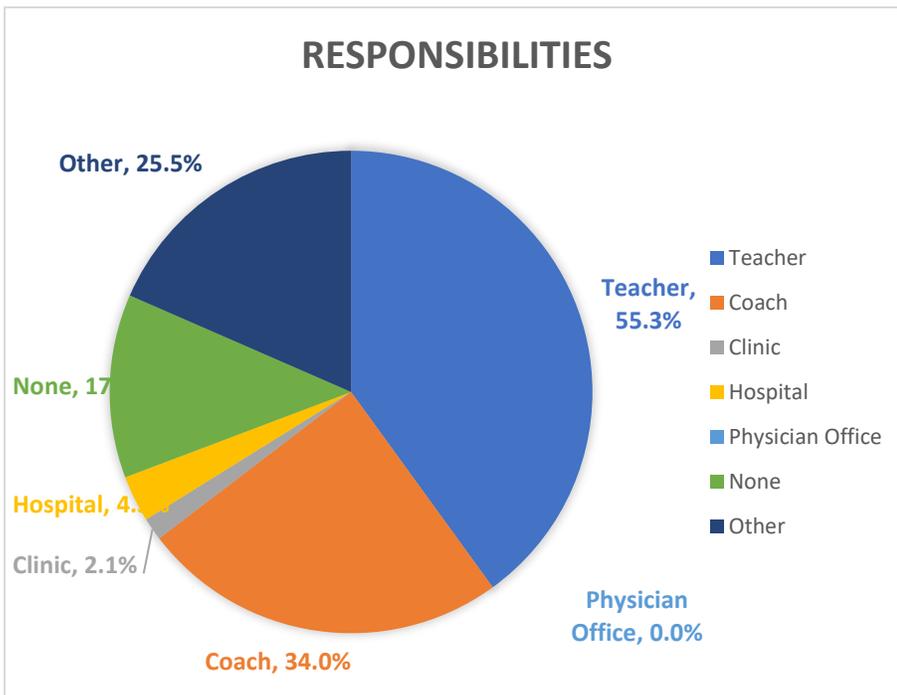
<b>Provider</b>	<b>Football</b>	<b>Wrestling</b>	<b>Other Contact Sports</b>	<b>Other Non-Contact Sports</b>
AT	90.4%	13.0%	18.3%	8.7%
FR	68.1%	8.5%	14.9%	21.3%

Note: AT  $n = 115$ , FR  $n = 47$

Breakdown of Other Responsibilities of the Athletic Trainer Participants



Breakdown of Other Responsibilities of the First Responder Participants



APPENDIX D

EQUIPMENT ACCESS

Comparison of Shared vs Exclusive Use of Equipment for First Responders and Athletic Trainers

<b>Equipment</b>	<b>FR % Shared</b>	<b>FR % Exclusive</b>	<b>AT % Shared</b>	<b>AT % Exclusive</b>	$\chi^2$	<b>P</b>
Spine Board <sup>^</sup>	24.1%	13.8%	6.3%	24.0%	8.11	.017*
Splint Kit#	30.0%	23.3%	3.1%	79.2%	35.94	.001**
Rectal Thermometer#	13.3%	10%	1.0%	49.0%	20.34	.001**
Cold Water Immersion Tub	22.6%	48.4%	11.5%	76.0%	8.51	.014*
BP Cuff	19.4%	35.5%	3.1%	93.8%	49.65	.001**
Stethoscope	19.4%	29.0%	2.1%	93.8%	57.19	.001**
Supplemental Oxygen	3.2%	3.2%	4.2%	7.3%	0.73	.693
First Aid Materials	19.4%	80.6%	3.1%	96.9%	9.37	.007**
CPR Mask#	16.7%	73.3%	1.1%	94.7%	14.11	.001**
Protective Equipment	19.4%	67.7%	4.2%	94.8%	17.18	.001*
Removal Tools						
Pulse Oximeter	12.9%	19.4%	3.1%	62.5%	18.59	.001**
Glucometer#	10.0%	13.3%	11.5%	20.8%	0.98	.612
Rehab Equipment	41.9%	29.0%	22.9%	74.0%	27.23	.010**
Therapeutic Modalities	12.9%	22.6%	3.1%	69.8%	22.09	.001**

FR = First Responder,  $n = 31$  (<sup>^</sup>  $n = 29$ , #  $n = 30$ ) AT = Athletic Trainer,  $n = 96$  (#  $n = 95$ )

\*Significant  $p < .02$  (two-tailed), \*\*Significant  $p < .01$  (two-tailed)

APPENDIX E

COMPARISON OF THE ELEMENTS OF WRITTEN POLICIES

Comparison of Elements Included in the Heat Illness Policy for FRs and ATs

<b>Element</b>	<b># of FR</b>	<b>% of FR</b>	<b># of AT</b>	<b>% of AT</b>
Unlimited access to fluids during practice	23	92.0%	90	94.7%
Heat acclimatization guidelines	23	92.0%	89	93.7%
Environmental based activity/practice modifications	24	96.0%	92	96.8%
Guidelines to cool first, transport second	18	72.0%	91	95.8%
Use of rectal temperature as the assessment method	8	32.0%	43	45.3%
Use of cold-water immersion as the treatment method	21	84.0%	88	92.6%

NOTE: FR=First Responder, AT=Athletic Trainer, # of those who have a written policy (FR *n* = 25, AT *n* = 95) who include this element in their policy

Comparison of Elements Included in the Cold Illness Policy for FRs and ATs

<b>Element</b>	<b># of FR</b>	<b>% of FR</b>	<b># of AT</b>	<b>% of AT</b>
Unlimited access to fluids during activity	5	62.5%	26	81.3%
Encourage athletes to hydrate when not thirsty	7	87.5%	29	90.6%
Identification of participants at higher risk for cold illness	6	75.0%	23	71.9%
Use of wind-chill temp to determine practice modifications	7	87.5%	22	68.8%
Provision of supplies for active rewarming	7	87.5%	20	62.5%
Use of rectal temperature to monitor core temperature	4	50.0%	15	46.9%
Plan to initiate rapid transport when required	7	87.5%	23	71.9%

NOTE: FR=First Responder, AT=Athletic Trainer, # of those who have a written policy (FR *n* = 8, AT *n* = 32) who include this element in their policy

Comparison of Elements Included in the Lightning Policy for FRs and ATs

<b>Element</b>	<b># of FR</b>	<b>% of FR</b>	<b># of AT</b>	<b>% of AT</b>
Assigned staff member to monitor weather conditions	28	90.3%	93	95.9%
Identification of a safe space for each team	26	83.9%	96	99.0%
Suspension of activity and evacuation w/ thunder or lightning	28	90.3%	92	94.8%
Use of 30-minute rule to dictate length of activity suspension	30	96.8%	97	100%
Use of lightning detection devices or mobile phone apps	27	87.1%	95	97.9%

NOTE: FR=First Responder, AT=Athletic Trainer, # of those who have a written policy (FR *n* = 31, AT *n* = 97) who include this element in their policy

Comparison of Elements Included in the EAP for FRs and ATs

<b>Element</b>	<b># of FR</b>	<b>% of FR</b>	<b># of AT</b>	<b>% of AT</b>
Developed with local EMS, school public safety, school admin	23	76.7%	78	80.4%
Distributed/reviewed by all relevant athletics staff yearly	26	86.7%	90	92.8%
Rehearsed yearly w/ AD, coaches, pertinent medical personnel	22	73.3%	77	85.6%
Updated yearly by all relevant athletic staff members	23	76.7%	89	91.8%
Identifies personnel/responsibilities w/chain of command	25	83.3%	91	93.8%
Identifies location of on-site emergency equipment	26	86.7%	92	94.8%
Lists contact info for EMS/key personnel, facility address	21	70.0%	90	92.8%
Recommendation for documentation after catastrophic events	12	40.0%	62	63.9%
Info for healthcare professionals included in review/rehearsal	14	46.7%	70	72.2%
Specific to each practice and game venue at the school	25	83.3%	93	95.9%
Posted at every venue	24	80.0%	88	90.7%

NOTE: FR=First Responder, AT=Athletic Trainer, # of those who have a written policy (FR  $n = 30$ , AT  $n = 97$ ) who include this element in their policy

Comparison of Elements Included in the Mental Health Policy for FRs and ATs

<b>Element</b>	<b># of FR</b>	<b>% of FR</b>	<b># of AT</b>	<b>% of AT</b>
Provides data on mental health disorders in adolescents	2	66.7%	10	58.8%
Outlines how to recognize psychological concerns in athletes	3	100%	13	76.5%
Steps to take in the event of a mental health emergency	2	66.7%	14	82.4%
Steps to take in the event of a catastrophic mental health event	3	100%	13	76.5%
Crisis counseling plan to be implem. after catastrophic event	3	100%	12	70.6%
Developed in collaboration with mental health professionals	3	100%	10	58.8%
Approved by district general counsel and/or school board	3	100%	8	47.1%

NOTE: FR=First Responder, AT=Athletic Trainer, # of those who have a written policy (FR  $n = 3$ , AT  $n = 17$ ) who include this element in their policy

APPENDIX F

COMPARISON OF KNOWLEDGE SCORES

Knowledge Scores for FRs and ATs for the Recognition of Exertional Heat Stroke

	<b>Altered mental status*</b>	<b>Core temp &gt;104°*</b>	<b>Pale Skin</b>	<b>Mild Headache</b>	<b>Elevated Blood Pressure</b>	<b>Swelling of Hands and Feet</b>
FR <i>n</i> (%)	29 (93.5%)	28 (90.3%)	21 (67.7%)	25 (80.6%)	19 (61.3%)	14 (45.2%)
AT <i>n</i> (%)	92 (98.9%)	89 (95.7%)	53 (57.0%)	87 (93.5%)	30 (32.2%)	13 (14.0%)

NOTE: FR=First Responder, AT=Athletic Trainer, \*Correct responses; FR *n* = 31, AT *n* = 93

Knowledge Scores for FRs and ATs for the Immediate Care of Exertional Heat Stroke

	<b>Use of Rectal Therm*</b>	<b>Full Body Immersion Cold Water*</b>	<b>Transport After Cooling*</b>	<b>Immediate Referral to Hospital</b>	<b>Use of Tympanic Therm</b>	<b>Ice Bags on Pulse Points</b>
FR <i>n</i> (%)	21 (67.7%)	26 (83.9%)	22 (71.0%)	19 (61.3%)	5 (16.1%)	21 (67.7%)
AT <i>n</i> (%)	91 (97.8%)	93 (100%)	82 (88.2%)	17 (18.3%)	2 (2.2%)	26 (28.0%)

NOTE: FR=First Responder, AT=Athletic Trainer, \*Correct responses; FR *n* = 31, AT *n* = 93

Knowledge Scores for FRs and ATs for Adolescents with a Concussion

	<b>Immediate Removal and Eval*</b>	<b>Progressive RTP once symptoms resolve*</b>	<b>Longer time before RTP*</b>	<b>Grading of concussions</b>	<b>CT before cleared to play</b>	<b>Daily neurocognitive testing</b>
FR <i>n</i> (%)	31 (100%)	30 (96.8%)	14 (45.2%)	14 (45.2%)	7 (22.6%)	16 (51.6%)
AT <i>n</i> (%)	93 (100%)	92 (98.9%)	17 (18.3%)	4 (4.3%)	2 (2.2%)	28 (30.1%)

NOTE: FR=First Responder, AT=Athletic Trainer, \*Correct responses; FR *n* = 31, AT *n* = 93

Knowledge Scores for FRs and ATs for Managing Possible Cervical Spine Injuries

	<b>Neck in Alignment before spine board*</b>	<b>Lift and slide, least movement of spine*</b>	<b>Use log-roll for face-down athlete*</b>	<b>Remove football helmet before spine board</b>	<b>Apply traction to the neck to lessen damage</b>	<b>Cutting the face mask, least movement</b>
FR <i>n</i> (%)	10 (32.3%)	20 (64.5%)	24 (77.4%)	6 (19.4%)	13 (41.9%)	22 (71.0%)
AT <i>n</i> (%)	31 (33.3%)	86 (92.5%)	86 (92.5%)	29 (31.2%)	10 (10.8%)	64 (68.8%)

NOTE: FR=First Responder, AT=Athletic Trainer, \*Correct responses; FR *n* = 31, AT *n* = 93

Knowledge Scores for FRs and ATs for Sudden Cardiac Arrest

	<b>AED within 1 minute of every venue on campus*</b>	<b>Sudden collapse and unconsciousness indicate SCA*</b>	<b>Common for athlete with SCA to appear to have a seizure*</b>	<b>All athletes need EKG during PPE</b>	<b>AED should not be used in the rain</b>	<b>Athlete with a murmur is at increased risk of SCA</b>
FR <i>n</i> (%)	28 (96.6%)	25 (86.2%)	8 (27.6%)	5 (17.2%)	4 (13.8%)	11 (37.9%)
AT <i>n</i> (%)	91 (97.8%)	87 (93.5%)	21 (22.6%)	16 (17.2%)	3 (3.2%)	26 (28.0%)

NOTE: FR=First Responder, AT=Athletic Trainer, \*Correct responses; FR *n* = 29, AT *n* = 93

APPENDIX G

SUMMARY OF FOCUS GROUPS

Overview of First Responder Focus Group Participants Experience and Current Position

<b>Participant</b>	<b>Pseudonym</b>	<b>Years as</b>		<b>Employer</b>	<b>Additional Responsibilities</b>
		<b>FR</b>	<b>FR</b>		
FR 1	Jeff	20	PT clinic	PT clinic Full-time (volunteer FR)	
FR 2	Peter	5	School	Athletic Director	
FR 3	Greg	<1	School	Teaches PE, coach	

NOTE: FR=First Responder, PT=Physical Therapy, PE=Physical Education

Overview of Athletic Training Focus Group Participants Experience and Current Position

<b>Participant</b>	<b>Pseudonym</b>	<b>Years at</b>		<b>Employer</b>	<b>Additional Responsibilities</b>
		<b>AT</b>	<b>School</b>		
AT 1	Diane	7	5	School	No teaching
AT 2	Hannah	2	2	Hospital	No clinic
AT 3	Nate	2	2	Hospital	No clinic
AT 4	Ben	6	5	School	Teaches SM
AT 5	Christine	5	5	School	Teaches PE
AT 6	George	5	4	PT company	½ day clinic
AT 7	Jennifer	2	<1	PT company	No clinic
AT 8	Frank	20	15	PT company	No clinic
AT 9	Wendy	3	2	Hospital	No clinic
AT 10	Lucy	8	7	School	Teaches SM
AT 11	Susan	18	7	School	Teaches science
AT 12	Melissa	12	3	PT company	No clinic
AT 13	Paul	35	8	School	Teaches SM

NOTE: AT=Athletic Trainer, SM=Sports Medicine, PE=Physical Education, PT=Physical Therapy

Overview of Themes for Barriers and Facilitators to Meeting the Appropriate Medical Care Standards (AMCS)

Theme	Operational Definition	Supporting Quotes	# of Participants Exhibiting Theme/Total Participants
<b>Personal Barrier</b>			
Lack of Knowledge	Not having the educational background necessary to implement a standard	<p><u>Greg</u>: “Having a limited knowledge base hurts. And sometimes I wonder if, if the way it's set up isn't just a liability, a way to cover the school, but... I don't think that first responders that serve in our school district [are]... adequately prepared to handle a catastrophic injury...I think a more in-depth certification for first responders, and maybe my knowledge is not up to date, but I don't have any type of first responder certification to serve in the role that I do. Other than [being] CPR certified and the concussion course every year.”</p> <p><u>Peter</u>: “There was a really late heat wave this year. But [the heat index] that's an area that I didn't feel...really prepared for.”</p> <p><u>Lucy</u>: “I trust mine [first responder] to call 911 and do CPR, nothing else.”</p> <p><u>Susan</u>: “They [first responders] don't have any regulations. As long as they know CPR, know first aid, that's good enough... the first responder that's supposed to help [me], all she knows how to do is CPR and first aid. She refuses to tape or do treatments.”</p>	3/3 First Responders 6/13 Athletic Trainers
<b>Organizational Barriers</b>			
Lack of Support	Generally not having the administrative support to implement policies, or lack of understanding of what ATs do	<p><u>Paul</u>: “I met the athletic trainer at X High School. She's been there for, I think, three years. Right in the middle of football season she quit...she said "I got no support." Coaches wouldn't listen to me, they wouldn't listen to my recommendations. The administration wouldn't listen to me. I got tired of it, so I went and found somewhere that would listen.”</p> <p><u>Christine</u>: “I know there's other counties in this state that understand that [time commitment] and that they have people that work only doing athletic training stuff during the day and taking care of athletics, and not having to worry about having to have a teaching position or doing something else before they can get to their athletic training duties. Here we struggle with that, I feel like, which is why I feel like we don't have very many athletic trainers in this county, because it's "Oh, the teaching part of it is your big job, and the athletic training part of it is just the little thing that you do on the side." That the focus on the importance, isn't there.”</p> <p><u>Susan</u>: “I think that one of the things that I'd like to have, more support for us.”</p>	2/3 FRs 8/13 ATs

Lack of Resources	Insufficient human resources, space, budget, or equipment	<p><u>Peter</u>: “It all boils down to money. If they had the money, they would hire an athletic trainer.”</p> <p><u>Christine</u>: “If I’m lucky, I can maybe spend anywhere between 1000 to 1500 dollars...and that limits me for what I can and can’t do”</p> <p><u>Christine</u>: “If this would be a place where they would look at what we do as being more important, instead of them thinking, it’s just a sideline, afternoon job, and that it’s a really a full time all day type of job, it would probably help us, at least in my case, be able to really focus on what we need to do for our athletes instead of cramming it all into a little time, after school when we finally get time, and being able to focus on more of the things that we need to get done instead of all right, I can do this and this but this is going to have to wait or overlooking something that might be important because you got to do something else.”</p> <p><u>Jennifer</u>: “Because of my limited space and I don’t have really modalities, I have a few ankle weights and stuff like that, so there’s only a limited stuff that I can even do in my training room area for someone who’s pre-surgical or post-surgical.”</p> <p><u>Frank</u>: “Resources will be my number one limitation. It’s not necessarily just funds but also the limitations of space. Everybody comes in at three o’clock. At three o’clock, if you are in fall season, you have, football, soccer, volleyball and so on, and have 25 kids...that need attention...If you’re limited by space, and just the number of hands of who can deal with what’s needed in a short amount of time.”</p>	3/3 FRs 12/13 ATs
5 Lack of Time	Not having enough time during the day to meet all of the standards	<p><u>Peter</u>: “Especially as the AD I get called away for all kinds of things, from the commode’s stopped up to they ran out of hot dogs in the concession stand. You know, so I get pulled in a lot of different directions and that’s why football or for football, I had another person there and I was there kind of like his backup if somebody if somebody needed something.”</p> <p><u>Lucy</u>: “I mean, ultimately, something’s going to suffer either the teaching side or the athletic training side, or both, you’re not going to be able to be 100% the best that you can be in both of those situations.”</p> <p><u>George</u>: “Biggest thing with mine is, is the fact that I’m required to be in in PT clinic, I’m required at the high school and then I gotta show up at the middle school as well. So it’s obviously hard for me to be at all these places at once. So there’s times where, like yesterday, I had a middle school wrestling match and I couldn’t be at the high school for practices or rehab...obviously [I] can’t cover multiple things at one time.”</p> <p><u>Paul</u>: “I’m tied up from seven o’clock in the morning until 2:18 in the afternoon, with teaching responsibilities, and I’m not only a teacher, I’m also the first responder for any emergency that occurs on campus. During that time, I got kids constantly interrupting my school day. I mean, it’s just one thing after another. But actually...[it] is the teaching part keeps me from doing that, the fact that I am by myself as well. I’m only one person, I have to cover all these sports and all these athletes.”</p>	3/3 FRs 11/13 ATs

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**Personal Facilitators**

Relationships	Support from personal relationships that support implementing standards	<p>Ben: "The support from your supervisor or athletic director...plays a major role in facilitating how you operate as an athletic trainer. If you have that person that is behind you to support your decision in your roles, it helps when furthering along that conversation with a new coach or visiting team..."</p> <p>Paul: "When you don't have your administrator, your athletic director backing you, then your just gonna have a lot of problems."</p> <p>Lucy: "Administrative support. Having your principal, specifically your principal and your AD, backing you and on board, because when a parent bucks or coach bucks, that's who they're going to go to. They also control the money."</p> <p>Melissa: "I am in a really good location, I think that's why it really helps with referrals. I have a really great support team I actually have two team physicians and a PA, so that's pretty robust. I have a[n] ortho and a gen med, so I have it covered in ortho and the concussion protocols sense. So those are really helpful, gen med aspect and they're just amazing physicians and the clinics always squeezing, my kids have no idea, they're literally like DI college level appointments."</p>	FRs: 2/3 ATs: 10/13
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**Organizational Facilitators**

Structures	Organizational structures that support implementing standards	<p>Peter: "A [3A] high school in our county...created a part time teaching position and then the other half time is athletic trainer and, she's...actually teaching athletic training, two classes a day."</p> <p>Lucy: "I would say anything that there is a North Carolina High School Athletic Association policy that backs makes it a lot easier because my coaches, my ADs, my principals, they understand fines and, you know, ineligible players and having to forfeit contests due to ineligible players. They don't like paying money, they don't like having to forfeit."</p> <p>Wendy: "I think one of the biggest things that I saw coming in to my job, we do a really good pre-participation physical exam within my like school district. They take a couple days out of the year at the end of the school year, where all the students have the opportunity to go to one location and they spend a couple hours while they're there, but they get a very thorough screening...so we're able to really know what's going on with the kids and if there's any reason we should be concerned for them participating in sport."</p>	FRs: 2/3 ATs: 8/13
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APPENDIX H

SURVEY INSTRUMENT

**An Analysis of Medical Care at North Carolina High School Athletic Association Member Schools**

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Start of Block: Consent Form



Click link for consent form:

[Consent form](#)

I have read the consent form and agree to participate in the survey.

Yes

No

*Skip To: End of Survey If Click link for consent form:Consent form I have read the consent form and agree to participate i... = No*

End of Block: Consent Form

---

Start of Block: Demographic Information

This first group of questions is demographic information about **you and your role at the school**. If you work at more than one school, please think about the **school where you spend the majority of your time each week** in answering all of the following questions. If you spend equal amounts of time across locations, then select one to focus on for the entirety of the survey.

---



Are you the **primary** person in charge of providing care for athletes at your school?

Yes

No

---



What is your **current role** at the school?

- Athletic Trainer
- First Responder

*Skip To: Q115 If What is your current role at the school? = First Responder Display This Question: If What is your current role at the school? = Athletic Trainer*



Which of the following **best describes** your position?

- Full time (meaning you provide AT services to only 1 school, 5 days a week, 30+ hours per week and 10 months a year)
- Part time (meaning anything less than full-time, including providing AT services at more than one school)
- Per diem (meaning you are paid an hourly wage to work events)

Which of the following sports and events do you cover? (choose all that apply)

	Football	Wrestling	Other contact sports	Non-contact sports
Practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Home events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Away events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My school doesn't offer this sport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I don't cover this sport/sports	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Are you employed by a **school district, clinic/hospital**, or are you a **volunteer**?

- District (Salary is paid by the school or district and the school district is your employer)
- Clinic/hospital (An outreach clinic, hospital, or other entity that contracts AT services to a high school)
- Volunteer (Not compensated to perform the AT services)

What **other responsibilities** do you have associated with your position? (Choose all that apply)

- Teacher
- Coach (which sport) \_\_\_\_\_
- Clinic
- Hospital
- Physician Office
- None
- Other (please describe)  
\_\_\_\_\_

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The following questions are related to your **school**. If you work at more than one school, please think about the school where you spend the majority of your time each week in answering all of the following questions. If you spend equal amounts of time across locations, then select one to focus on for the entirety of the survey.

In which **region** of North Carolina is your school located?

**Region 1** (Beaufort, Bertie, Camden, Chowan, Currituck, Dare, Gates, Hertford, Hyde, Martin, Pasquotank, Perquimans, Pitt, Tyrell, Washington)

**Region 2** (Brunswick, Carteret, Craven, Duplin, Greene, Jones, Lenoir, New Hanover, Onslow, Pamlico, Pender, Sampson, Wayne)

**Region 3** (Durham, Edgecombe, Franklin, Granville, Halifax, Johnston, Nash, Northampton, Orange, Person, Vance, Wake, Warren, Wilson)

**Region 4** (Bladen, Columbus, Cumberland, Harnett, Hoke, Lee, Montgomery, Moore, Richmond, Robeson, Scotland)

**Region 5** (Alamance, Caswell, Chatham, Davidson, Forsyth, Guilford, Randolph, Rockingham, Stokes)

**Region 6** (Anson, Cabarrus, Cleveland, Gaston, Lincoln, Mecklenburg, Rowan, Stanley, Union)

**Region 7** (Alexander, Alleghany, Ashe, Avery, Burke, Caldwell, Catawba, Davie, Iredell, Surry, Watagua, Wilkes, Yadkin)

**Region 8** (Buncombe, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, Macon, Madison, McDowell, Mitchell, Polk, Rutherford, Swain, Transylvania, Yancy)

---

What **athletic classification** is your school?

- 1A
- 2A
- 3A
- 4A

Approximately how many athletes are there at your school?

- Less than 101
  - 101-200
  - 201-300
  - 301-400
  - 401-500
  - More than 500
- 



In what type of **setting** is your school located?

- Urban (Large city, densely populated)
  - Suburban (Smaller cities or areas surrounding large cities)
  - Rural (Country, less populated)
-



Approximately how much money is spent each year for **athletic training supplies/equipment**?

- \$0 to \$1000
  - \$1001 to \$2500
  - \$2501 to \$5000
  - \$5001 to \$8,000
  - More than \$8,000
  - Not sure
- 



To the best of your knowledge, how many **automated external defibrillators (AEDs)** are available for each of the following?

	N/A	1	2	3	4	5 or more
Dedicated to your program	<input type="radio"/>					
Total for the school	<input type="radio"/>					

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This group of questions relates to the **staff members** who provide care to the athletes at your school. If you work at more than one school, please think about the school where you spend the majority of your time each week in answering all of the following questions. If you spend equal amounts of time across locations, then select one to focus on for the entirety of the survey.

---



Including yourself, how many of each of the following staff members provide care for the athletes at your school?

	N/A	1	2	3 or more
Full-time certified athletic trainer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Part-time certified athletic trainer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
First responder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

---



Including yourself, which of the following healthcare providers is **regularly** present **on-site** during athletic practices? (choose all that apply)

	Football	Wrestling	Other contact sports	Non-contact sports
Athletic Trainer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
First Responder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
School Nurse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Medical Technicians	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None of these healthcare providers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My school doesn't offer this sport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Including yourself which of the following healthcare providers is **regularly** present **on-site** during athletic events? (choose all that apply)

	Football	Wrestling	Other contact sports	Non-contact sports
Athletic Trainer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
First Responder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Physician	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
School Nurse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Medical Technicians	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None of these healthcare providers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
My school doesn't offer this sport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Page Break

**End of Block: Demographic Information**

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### Start of Block: Appropriate Care

This group of questions is based on what your school or organization provides overall (including all sports medicine staff members). If you work at more than one school, please think about the school where you spend the majority of your time each week in answering all of the following questions. If you spend equal amounts of time across locations, then select one to focus on for the entirety of the survey.

Including yourself, how often do the sports medicine staff members (either athletic trainer or first responders) at your school do each of the following?

---

Use the standardized pre-participation physical examination (PPE) form required by the NCHSAA to determine athletes' readiness to participate in activity?

- Never
- Rarely
- Sometimes
- Often
- Almost always



Use wellness programs to promote a safe progression of physical fitness and improve long-term health across an athlete's lifespan (i.e. assess fitness, implement fitness programs, implement strategies to minimize risk factors for chronic disease)?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
-



Ensure that the practice, competition, and athletic health care facilities are safe and clean?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
- 



Ensure equipment used by athletes are safe and clean?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
-



Ensure that equipment worn by athletes is properly fitted and maintained?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
- 



Ensure that personnel supervise athletes at all times when using athletic equipment?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
- 

Page Break

---

Including yourself, how often do the sports medicine staff members (either athletic trainer or first responders) at your school do each of the following?

---



Ensure that protective materials and products used to prevent athletic injuries are safely and appropriately applied?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
- 



Ensure that athletic participation occurs in a safe environment by modifying or cancelling activities based on established environmental policies?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
-



Provide education/counseling for athletes on nutrition, hydration, and dietary supplementation?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
- 



Provide on-site prevention of athletic injuries (such as stretching or strengthening programs)?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
-



Provide on-site recognition/evaluation of athletic injuries?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
- 



Provide on-site immediate care of athletic injuries?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
- 

Page Break

---

Including yourself, how often do the sports medicine staff members (either athletic trainer or first responders) at your school do each of the following?

---



Make referrals to appropriate health care providers based on the injury (including specialists)?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
- 



Provide on-site therapeutic interventions (pre-, post-, and non-surgical conditions) through developing, evaluating, and updating a plan of care for athletes?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
-



Develop/revise a comprehensive athletic emergency action plan (EAP) in conjunction with local emergency medical services (EMS) for each athletic venue?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
- 



Develop/revise a comprehensive management plan for at-risk athletes with psychological concerns?

- Never
  - Rarely
  - Sometimes
  - Often
  - Almost always
-



Implement a comprehensive athletic health care administration system to ensure appropriate medical care is provided?

- Never
- Rarely
- Sometimes
- Often
- Almost always

End of Block: Appropriate Care

---

Start of Block: Specific Questions

The next few questions are about **written policies** your school or organization might have. If you work at more than one school, please think about the school where you spend the majority of your time each week in answering all of the following questions. If you spend equal amounts of time across locations, then select one to focus on for the entirety of the survey.

---



Do you or your school or organization have a **written** policy and procedures manual for your **sports medicine** program?

- Yes
  - No
  - Not sure
-



Does your school or organization have **written policies, procedures, or protocols** for the following issues?

	Yes	No	Not sure
<b>Regular scheduled cleaning/disinfecting of the AT facility</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Regular scheduled cleaning/disinfecting of equipment used by athletes</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Proper <b>cleaning/disinfecting</b> procedures for the <b>AT facility</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Proper <b>cleaning/disinfecting</b> procedures for the <b>equipment</b> used by athletes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<b>Exposure Control Plan</b> to minimize employee contact with blood/body fluids	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



Does your school or organization have a **written policy** to prevent/manage **heat illnesses**?

Yes

No

Not sure

Display This Question:

If Does your school or organization have a written policy to prevent/manage heat illnesses?  
= Yes



Which of the following **elements** does the **written heat illness policy** address? (Choose all that apply)

- Unlimited access to fluids during practice
- Heat acclimatization guidelines
- Environmental based activity/practice modifications
- Guidelines to cool first, transport second
- Use of rectal temperature as the assessment method
- Use of cold water immersion as the treatment method



Does your school or organization have a **written policy** to ensure a safe environment in the case of **cold temperatures**?

- Yes
- No
- Not sure

*Display This Question:*

*If Does your school or organization have a written policy to ensure a safe environment in the case o... = Yes*



Which of the following **elements** does the written **cold illness policy** address? (Choose all that apply)

- Ensures unlimited access to fluids during activity
- Encourages athletes to hydrate even when not thirsty
- Identification of participants at higher risk for cold illness
- Use of wind-chill temperature to determine practice modifications
- Provision of supplies for active rewarming
- Use of rectal thermometer to monitor core temperature
- Plan to initiate rapid transport when required

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Page Break

There are a few more questions about written policies your school or organization might have. If you work at more than one school, please think about the school where you spend the majority of your time each week in answering all of the following questions. If you spend equal amounts of time across locations, then select one to focus on for the entirety of the survey.

---



Does your school or organization have a **written policy** to ensure a safe environment in the case of **lightning**?

- Yes
  - No
  - Not sure
- 

*Display This Question:*

*If Does your school or organization have a written policy to ensure a safe environment in the case o... = Yes*

Which of the following **elements** is included in the **written lightning policy**? (Choose all that apply)

- Assigned staff member to monitor weather conditions before and during practices and contests
  - Identification of a safe space for each team in a location with plumbing and wiring
  - Suspension of activity and evacuation of the area if thunder is heard or lightning is seen
  - Use of the 30-minute rule to dictate the length of activity suspension
  - Use of lightning-detection devices or mobile phone apps to make decisions
-

Does your school or organization have a **written Emergency Action Plan (EAP)** for managing serious and/or potentially life-threatening conditions?

- Yes
- No
- Not sure

*Display This Question:*

*If Does your school or organization have a written Emergency Action Plan (EAP) for managing serious... = Yes*



Which of the following is true about the **Emergency Action Plan (EAP)** at your school? (Choose all that apply)

- Developed in conjunction with local EMS, school public safety officers, and school administrators
- Distributed and reviewed by all relevant athletics staff members yearly
- Rehearsed yearly with the AD, coaches, and other pertinent medical personnel
- Updated yearly by all relevant athletic staff members
- Identifies personnel and their responsibilities to carry out the plan of action with designated chain of command
- Identifies location of on-site emergency equipment
- Lists contact information for EMS and other key personnel, as well as the facility address and location
- Provides recommendations for documentation that should be taken after a catastrophic incident

Includes information for healthcare professionals providing medical coverage which is included in the review and rehearsal

Specific to each practice and game venue at the school

Is posted at every venue



Does your school or organization have a **written policy** for dealing with **mental health** issues?

Yes

No

Not sure

*Display This Question:*

*If Does your school or organization have a written policy for dealing with mental health issues? = Yes*



Which of the following is true about the **written mental health policy** at your school? (Choose all that apply)

it provides data on mental health disorders in adolescents and young adults (incidence, risk factors)

it outlines how to recognize psychological concerns in athletes

it outlines the steps to be taken in the event of a mental health emergency (attempted harm to oneself or others)

it outlines the steps to be taken in the event of mental health catastrophic incident (suicide, homicide, permanent disability)

it includes a crisis counseling plan to be implemented after a catastrophic incident

it was developed in collaboration with mental health professionals

it was approved by district general counsel and/or the local school board

Page Break

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The following questions are related to more specific aspects of the care provided by the sports medicine staff at your **school or organization** as well. If you work at more than one school, please think about the school where you spend the majority of your time each week in answering all of the following questions. If you spend equal amounts of time across locations, then select one to focus on for the entirety of the survey.

---



Does your **school or organization** require each athlete to have a pre-participation examination before they are cleared to practice or compete?

Yes

No

---



Are there signs **posted** in the sports medicine facility showing **proper hand washing technique**?

Yes

No

Don't have a facility

---



Does your **school or organization** ensure a **yearly safety inspection/calibration** of medical devices such as therapeutic modalities?

- Yes
  - No
  - Don't have equipment that needs inspection/calibration
- 



Does your **school or organization** have an established **Athletic Health Care Team (AHCT)** (athletic trainer, physician, emergency medical services, etc.) with specified roles/responsibilities for each?

- Yes
  - No
  - Not sure
- 



Do **your school or organization** have a **formal agreement** with a supervising medical director or team physician?

- Yes
  - No
  - Not sure
-



Does your **school or organization** have **guidelines** for when, where, how, and by whom athletic injuries/illnesses should be referred to outside medical providers?

Yes

No

---



Does your **school or organization** require **coaches** to be trained in CPR/AED use?

Yes

No

---



Is there **AED access within 1 minute** of every athletic venue at your school?

Yes

No

---

Page Break

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The following questions are specific to what **you do** in your role as the athletic trainer or first responder at the school. If you work at more than one school, please think about the school where you spend the majority of your time each week in answering all of the following questions. If you spend equal amounts of time across locations, then select one to focus on for the entirety of the survey.

---

*Display This Question:*

*If What is your current role at the school? = First Responder*

X→

Have **you** been taught (ex. formal training, class, etc.) how to **apply protective taping/bracing**?

Yes

No

---

*Display This Question:*

*If What is your current role at the school? = First Responder*

X→

Have **you** been taught (ex. formal training, class, etc.) how to properly **fit protective equipment**?

Yes

No

---

X→

Do **you** provide **on-site prevention programs** such as stretching/conditioning for your athletes?

Yes

No

---

X→

Do **you** provide **on-site evaluation of injuries** such as concussions for your athletes?

Yes

No

---



Do **you** provide **on-site evaluation of medical conditions** such as heat illnesses?

Yes

No

---



Do **you** provide **on-site immediate care** of conditions such as heat stroke?

Yes

No

---



Do **you** make **referrals to the appropriate medical provider** when your evaluation warrants referral?

Yes

No

---

Page Break

---

These questions are specific to what you do yourself in your role as the athletic trainer or first responder at the school. If you work at more than one site, answer the questions **based on the school where you spend the most time**. If you spend equal time at more than one school, choose one school to answer for the entire survey.



Do **you** regularly provide **on-site rehabilitation** after an athlete is **injured**?

Yes

No

---



Do **you** regularly provide **on-site rehabilitation** after an athlete has **surgery**?

Yes

No

---



Do **you** decide when the athletes can **return to play** after an injury in consultation with a physician?

Yes

No

---



Do **you** evaluate the athlete's **psychological readiness** to **return to play** after an injury?

Yes

No

---



Do **you** use **therapeutic modalities** such as ice or heat to manage injuries?

Yes

No

---



Do **you** use other **therapeutic modalities** such as electrical stimulation, ultrasound, etc. to manage injuries?

Yes

No

---



Do **you** regularly provide **on-site reconditioning** of an athlete after they have been injured?

Yes

No

---

Page Break

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These questions are specific to what you do yourself in your role as the athletic trainer or first responder at the school. If you work at more than one site, answer the questions **based on the school where you spend the most time**. If you spend equal time at more than one school, choose one school to answer for the entire survey.

---



Have **you** been **formally taught** how to recognize possible **mental health** conditions (eg. professional development, Mental Health First Aid, etc.)?

Yes

No

---

Do **you** have a formal mechanism for **referring** athletes with potential **mental health** issues?

Yes

No

---



Do **you** track/report on **injury/illness trends** and include strategies to mitigate modifiable risk factors based on the data?

Yes

No

---



Do **you** educate/counsel athletes on how to meet their **dietary goals and unique nutritional needs**?

Yes

No

---



Do **you** educate/counsel athletes on how to **stay properly hydrated**?

Yes

No

---



Do **you** educate/counsel athletes on the safety and efficacy of **dietary supplements**?

Yes

No

---



Do **you** fit **protective equipment** such as helmets and shoulder pads?

- Yes
  - No
  - Not my responsibility
- 



Do **you** coordinate the **reconditioning of protective equipment** such as helmets?

- Yes
- No
- Not my responsibility
- Not done at my school

Page Break

---

Which of the following **equipment** do **you** have access to at your school?

	No Access	Shared Equipment	Exclusive Use
Spine Board	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Splint kit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rectal thermometer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cold water immersion tub	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blood pressure cuff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stethoscope	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supplemental oxygen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
First aid materials (bandages, gloves, scissors, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
CPR mask	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protective equipment removal tools (e.g. tools to remove face mask, shears for cutting shoulder pads)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pulse oximeter	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Glucometer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rehabilitation equipment (e.g. cuff weights, small dumbbells, tubing, bands, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Therapeutic modalities (e.g. TENS unit, ultrasound unit, whirlpool, etc.)



---

### End of Block: Specific Questions

### Start of Block: Knowledge

This final group of questions asks about several of the more common emergency conditions you might encounter in your role as an athletic trainer or first responder. As a reminder all responses are anonymous and cannot be linked to you in any way.

---



Which of the following signs/symptoms together are **MOST** indicative of **exertional heat stroke?** (Choose all that apply)

Swelling of hands and feet

Pale skin

Altered mental status

Core temperature of >104 degrees F

Elevated blood pressure

Mild headache

---



Which of the following are MOST appropriate for the **immediate care of heat stroke**? (Choose all that apply)

- Use of rectal thermometer to measure core body temperature
- Immediate referral to the closest medical facility
- Full body immersion in a tub of cold water
- Transporting to the closest medical facility after cooling has ceased
- Use of tympanic (in the ear) thermometer to measure core body temperature
- Use of ice bags around pulse points to cool the athlete



Which of the following are true about an adolescent athlete who has suffered from a possible **concussion**? (Choose all that apply)

- Any athlete suspected of having a concussion should be removed from activity immediately and evaluated by a licensed health care provider
- Concussions should be graded to determine how long the athlete has to sit out
- Athletes must undergo a progressive return to play protocol once they are asymptomatic
- Athletes with a suspected concussion need a CT scan before they are cleared to play
- A more prolonged progressive return to play protocol is necessary for adolescent athletes

Daily neurocognitive testing should be done until the athlete is asymptomatic

---



Which of the following are true about managing a possible **cervical spine injury**? (Choose all that apply)

The neck should be put into alignment before placing the athlete on a spine board

A football helmet should be removed prior to placing the athlete on a spine board

Traction should be applied to the neck immediately in order to lessen the damage to the spinal cord

A lift-and-slide technique (eg., 6-plus-person lift, straddle lift and slide) has been shown to produce the least movement of the spine

Cutting the face-mask to access the airway produces the least amount of movement of the athlete's head

If the athlete is face-down with a suspected neck injury, a log-roll must be used

---



Which of the following are true about **sudden cardiac arrest** in athletes? (Choose all that apply)

- An AED should be available within one minute from every athletic venue at the school
- Sudden cardiac arrest should be suspected in any athlete who has collapsed and is unresponsive
- Research clearly supports that every athlete should have an EKG as part of the pre-participation physical exam (PPE)
- It is common for an athlete with sudden cardiac arrest to appear to be having a seizure
- An AED should not be used if it is raining
- An athlete with a heart murmur is at a much greater risk of sudden cardiac arrest than other athletes

End of Block: Knowledge

---

## APPENDIX I

### FOCUS GROUP GUIDES

#### **AT Focus Group Guide**

1. Is there anything in your day that limits your ability to function as an athletic trainer?
2. How familiar are you with the AMCS document?
3. Tell me about the challenges you have in meeting the AMCS standards.
4. What facilitates you in meeting the AMCS standards?

#### **First Responder Focus Group Guide**

1. Do you have a separate job description for your first responder duties?
2. Is there anything that limits your ability to function as a first responder?
3. What training other than the NCCA Injury Management Course have you completed?
4. How well does the required 10 hours of annual CEUs prepare you for this role?
5. Tell me about the challenges you have in meeting these AMCS standards.
6. What facilitates you in meeting the AMCS standards?

APPENDIX J  
PRESENTATION



## Appropriate Medical Care for Secondary School Athletes in North Carolina

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### Objectives

- Provide an overview of the evolution of the appropriate care standards
- Describe appropriate medical care for the secondary school athlete
- Compare North Carolina athletic trainers (ATs) to first responders (FRs) related to the standards
- Identify standards that are being met well and areas in which there is room for improvement



## Background

- March 2019 - *Appropriate Medical Care Standards for Organizations Sponsoring Athletic Activity for the Secondary School Age Athlete (AMCS)*
- Revision of the 2005 guidelines that established what appropriate care entails
- NATA assembled an interdisciplinary task force which spent 2 years incorporating new research and revising the guidelines



## Background

- Increase from 11 guidelines to 12 Standards
  - Each standard has sub-standards to outline how to meet the standard including supporting documentation
  - Also includes relevant case law
- Program Assessment for Safety in Sport (PASS) is an online tool for schools to use to measure the level of care they are providing



## Overview of Study

- Survey of NC ATs and FRs
  - Likert scale questions for each standard
  - Yes/no questions for equipment, written policies, and sub-standards
  - Choose all that apply for elements of policies
- Follow-up Focus Groups
  - Barriers and facilitators to meeting specific standards



## Standard 1

Athletes' readiness to participate in activity is determined through a standardized pre-participation physical examination (PPE) screening process



# Standard 1 – Sub-standards



# Standard 1 – Sub-standards

**Doing Best**  
 Take these steps to control medication with the best results:  
 • Do not skip doses, even if you feel better.  
 • Take your medicine at the same time every day.  
 • Do not stop taking your medicine without talking to your doctor.  
 • If you have trouble taking your medicine, tell your doctor.

**Adhering to Safety Rules**  
 • Do not drink alcohol, use tobacco, or use recreational drugs.  
 • Do not take other medicines without talking to your doctor.  
 • Do not take your medicine if you are pregnant or breastfeeding.

**Medical Alert**  
 • Tell your doctor, pharmacist, and dentist that you are taking this medicine.  
 • Tell your family and friends that you are taking this medicine.  
 • Tell your insurance company that you are taking this medicine.



## Standard 1 - Results

- 100% of ATs and 96.9% of FRs report their school requires a PPE prior to participation
- There was a statistically significant difference between ATs and FRs
  - Both ATs and FRs reported this standard was easy to meet
  - NCHSAA form is beneficial
  - Some companies provide free comprehensive physicals



## Standard 2

Practice, competition and health care facilities as well as equipment used by athletes are safe and clean



## Standard 2 – Sub-standards



## Standard 2 - Results

Sub-standards	% of AT (n=115)	% of FR (n=47)
Signs posted for proper handwashing*	19.6 %	<b>25.0%</b>
Written policy for scheduled cleaning – AT Facility	36.0%	31.4%
Written policy for scheduled cleaning – equipment	22.0%	<b>38.2%</b>
Written policy for proper cleaning – AT Facility	42.0%	35.3%
Written policy for proper cleaning - equipment	29.0%	<b>47.0%</b>
Exposure Control Plan	76.0%	64.7%

\*Significant differences between ATs and FRs



## Standard 2 - Results

- Only 19.6% of ATs reported posting signs for proper handwashing
- 76.0% of ATs have a written Exposure Control Plan
- More have written policies related to cleaning the AT Facility than equipment
  - Percentages are still low

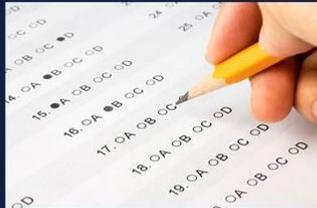


## Standard 3

Equipment worn by athletes is properly fitted and maintained while instructions to use safely and appropriately are provided



## Standard 3 – Sub-standards



## Standard 3 - Results

- Most ATs (74%) and FRs (81%) reported it was NOT their responsibility
  - ATs also reported they have to fix problems for improperly fitting equipment regularly
- Are those who fit the equipment trained?
  - 75.0% of FRs reported having formal training in how to properly fit protective equipment
- Who makes sure the coach is competent?



# Standard 4

Protective materials and products used to prevent athletic injuries are safely and appropriately applied



## Standard 4 – Sub-standards

- Qualified Medical Practitioner (QMP)



- If not an AT, verify and document appropriate training for the specific type of protective material to be used.



## Standard 4 – Results

- 87.5% of FRs reported having formal training in how to apply protective taping/bracing
- What is formal training?
- How it is documented?

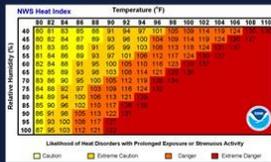


## Standard 5

Athletic participation in a safe environment is ensured or activity is modified or canceled based on established environmental policies



# Standard 5 – Sub-standards



AHCT



# Standard 5 – Results

	Athletic Trainers			First Responders		
Written Policy	Yes	No	Unsure	Yes	No	Unsure
Policy Manual	76.7%	23.2%	N/A	60.0%	40.0%	N/A
Heat Illness Policy*	95.0%	3.0%	2.0%	73.5%	14.7%	11.8%
Cold Illness Policy	32.3%	50.5%	17.2%	23.5%	41.2%	35.3%
Lightning Policy	99.0%	1.0%	0%	93.4%	9.1%	0%

\*Significant differences between ATs and FRs



## Standard 5 – Results (Heat)

- Only 72% of FRs had guidelines to cool first, transport second (AT 95.8%)
- Only 45.3% of ATs and 32.0% of FRs use rectal temperature
- Only 84.0% of FRs use cold-water immersion (AT 92.6%)



## Standard 5 – Results (Cold)

- FRs included 5 of the 7 important elements more often than ATs did
  - Identification of participants at higher risk
  - *Use of wind-chill temp to determine practice modifications*
  - *Provision of supplies for active rewarming*
  - Use of rectal temp to monitor core temp
  - *Plan to initiate rapid transport when required*
- ATs were more likely to include unlimited access to fluids and encourage athletes to hydrate when not thirsty



## Standard 5 – Results (Lightning)

- ATs were more likely than FRs to include all important elements
- Only 83.9% of FRs (99.0% of ATs) included a designated safe space for each team
- Only 87.1% of FRs (97.9% of ATs) use a lightning detection device or mobile phone app



## Standard 6

Education and counseling is provided for athletes on nutrition, hydration, and dietary supplementation



## Standard 6 – Sub-standards



## Standard 6 – Results

- ATs were significantly more likely than FRs to
  - Educate athletes on how to meet dietary goals
  - Educate athletes on safety/efficacy of dietary supplements
- Both ATs (99.0%) and FRs (93.8%) did a good job educating athletes on hydration



# Standard 7

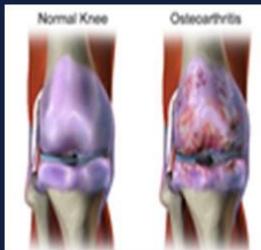
Wellness programs promote a safe progression of physical fitness and improve long-term health across an athlete's lifespan



## Standard 7 – Sub-standards



RD



CSCS



## Standard 7 - Results

- ATs reported the lowest level of compliance with this standard (slightly lower than FRs)
- ATs stated this was outside their scope
  - Identify community resources, create partnerships
- Area for potential growth
  - Public health impact



## Standard 8

Comprehensive athletic emergency action plan (EAP) is established and integrated with local EMS per athletic venue



## Standard 8 – Sub-standards



## Standard 8 - Results

- ATs were significantly more likely than FRs to
  - have access to all emergency equipment EXCEPT glucometers and supplemental oxygen
  - have developed the EAP in conjunction with local EMS
- AED access within 1 min. was relatively low for both
  - 72.2% of ATs and 65.6% of FRs



# Standard 9

On-site prevention, recognition, evaluation and immediate care of athletic injuries and illnesses are provided with appropriate medical referrals



## Standard 9 – Sub-standards

- QMP on-site based on the risk and rate of injury/illness
  - Calendar of QMP assignments are published with evidence of administrator approval
- Sudden death in sports management plan
  - Annual review by AHCT of the plan and any QI measures taken to improve the plan are documented



## Standard 9 - Results

- ATs are significantly more likely than FRs to:
  - Provide on-site prevention programs
  - Provide on-site evaluation of injuries
  - Provide on-site evaluation of medical conditions
  - Provide on-site immediate care of injuries and medical conditions
  - Track injury/illness trends to mitigate risk factors (only 46.9% of ATs vs 25.0% of FRs)
- Only 66% of ATs and 51.6% of FRs had guidelines for when/to whom to refer
- Only 65.6% of FRs (vs. 96.9% of ATs) make return to play decisions in consultation with a physician



## Standard 10

On-site therapeutic intervention (pre-, post-, and non-surgical conditions) outcomes are optimized by developing, evaluating, and updating a plan of care for athletes



## Standard 10 – Sub-standards



## Standard 10 - Results

Sub-standards	% AT (n=96)	% FR (n=32)
On-site rehabilitation after an athlete is injured*	94.8%	37.5%
On-site rehabilitation after an athlete has surgery*	<b>58.3%</b>	21.9%
On-site reconditioning of an athlete after injury*	87.5%	50.0%
Use of therapeutic modalities (ice, heat)*	98.9%	84.4%
Use of therapeutic modalities (e-stim, ultrasound)*	63.5%	21.9%
Evaluate psychological readiness to return to play	<b>60.4%</b>	43.8%

\*Significant differences between ATs and FRs



## Standard 10 - Results

- On-site rehab after surgery is lower
  - ATs reported lack of time, space, and equipment
- Few are evaluating psychological readiness
  - Mental health is an area for improvement

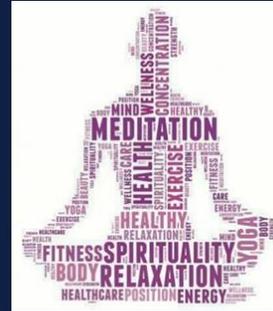


## Standard 11

Comprehensive management plan for at-risk athletes with psychological concerns



## Standard 11 – Sub-standards



## Standard 11 – Results

- This is an area for improvement
  - Only 17 ATs and 3 FRs reported having a written plan for managing mental health conditions
- FRs plans were more comprehensive than ATs
- One AT reported working with community resources to create a plan and a network
  - Potential model program



# Standard 12

Comprehensive athletic health care administration system is established to ensure appropriate medical care is provided



## Standard 12 – Sub-standards

AHCT



## Standard 12 - Results

Sport/Type of Event	% of ATs (n=115)	% of FRs (n=47)
Football practice	93.0%	68.1%
Football home games	93.0%	70.2%
Football away games	90.4%	68.1%
Wrestling practice	73.9%	21.3%
Wrestling home events	87.0%	53.2%
Wrestling away events	13.0%	8.5%
Other contact sports – practice	80.0%	21.3%
Other contact sports – home events	92.2%	48.9%
Other contact sports – away events	18.3%	14.9%
Non-contact sports – practice	78.3%	23.4%
Non-contact sports – home events	88.7%	57.4%
Non-contact sports – away events	8.7%	<b>21.3%</b>



## Standard 12 - Results

- AT are significantly more likely than FRs to
  - Have an established Athletic Health Care Team (AHCT)
  - Have a formal agreement with a Medical Director or Team Physician
  - Ensure yearly maintenance/calibration of equipment



## General Results

- Reported challenges to meeting standards
  - Lack of time, space, resources
- Reported facilitators to meeting the standards
  - Support, especially AD and Football coach
  - NCHSAA rules/forms



## Next Steps...

- Use the online PASS tool to evaluate your program <https://pass.nata.org/>
- Standard 7 Wellness Programs
  - Utilize or advocate for coaches who are certified strength and conditioning (CSCS) coaches
  - Speakers to address performance enhancing drugs
  - Think of this from a public health perspective
  - Consider adding a registered dietician to the AHCT



## Next Steps...

- Standard 11 Mental Health
  - Utilize community/school resources
  - Consider adding a mental health professional to the AHCT
  - Develop a plan for handling a mental health crisis
  - Provide a stress management workshop
- Track injuries/illness and services
  - Data to help implement prevention programs
  - Use data to advocate for additional human resources



## References

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## Questions?