

ATHLETIC TRAINERS USE OF PROPHYLACTIC DEVICES IN THE ANKLE

A THESIS

Submitted to the Faculty of the School of Graduate Studies  
and Research of California University of Pennsylvania in  
partial fulfillment of the requirements for the degree of

Master of Science

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California, Pennsylvania  
2012

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Graduate Athletic Training Education

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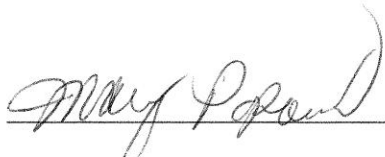
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## ACKNOWLEDGEMENTS

I would like to take this opportunity to identify and thank the individuals who have played an important role in my life and in the completion of this thesis. First, I would like to thank my family for helping me become the individual that I am today. Without your guidance and support, I would not be where I am today and have accomplished so many of my goals.

Next, I would like to thank my Cal U family. I will never forget my first experience as a certified athletic trainer. The experiences I encountered here will last a lifetime and I will be forever grateful for welcoming me with open arms. Also, I would like to thank all of my professors, ACI's, and fellow classmates from Franklin College for preparing me to enter the real world. You will always be thought of in the highest regard.

Lastly, I would like thank my thesis chairperson, Carol Biddington, and my committee members, Mike Meyer and Mary Popovich. Words cannot describe how grateful I am for all of you help during the research process. I have learned more about the research process from you than I ever thought. The knowledge, input, and guidance you have provided has made the completion of my thesis a great experience.

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## INTRODUCTION

The primary purpose of this study was to examine Certified Athletic Trainers use of ankle prophylactics in the prevention and treatment of injury. It is important to examine this relationship because athletic trainers frequently use ankle taping and/or bracing and have specific reasons as to why they choose one over the other.

Athletic trainers must choose between the two types of ankle prophylactics every day when preventing and treating ankle injuries. There was minimal research that supported the preference health care professionals utilize for ankle prophylactics. However, research has indicated similarities and differences between the two types. Both taping and bracing use result in little to no decrease in functional performance. According to research by Nelson et al,<sup>1</sup> bracing is a better option to use when one focuses on only injury prevention. Bracing tends to keep the foot in a more stabilized, closed packed position longer than taping does. Meana et al<sup>2</sup> reported that ankle tapings have a decrease in 50 percent of the ankle range of motion after a 30 minute exercise session, while bracing keeps the restricted range of motion longer. In addition, bracing is also a better option when looking from a cost standpoint. Buying



individual braces for each ankle is far cheaper than buying several boxes of tape.

Since most of the research points to using bracing over taping as a better option, it is important to see if athletic trainers are following research or using tape more often. There are various other reasons that one would choose either device over the other, which should be determined as well.

Ankle injuries are highly prevalent among athletes. Abián-Vicén et al<sup>3</sup> states acute lateral ankle injuries are the most common athletic-related injuries with an incidence rate of 38% to 50% of all athletic injuries reported. According to Nelson et al,<sup>1</sup> ankle injuries occur most in football and men's and women's basketball. Not only is there a high incidence of initial ankle injuries, but there is also a high rate (as high as 80%) of re-injury.<sup>4</sup>

Because of the prevalence of ankle injuries in the active population, preventative methods for ankle injuries have been implemented for the athletic population by athletic trainers. Ankle taping and bracing are used for prophylactic and protective purposes in athletic activity on a daily basis. Hubbard and Kaminski<sup>5</sup> and Delahunt et al<sup>6</sup> describe how improving proprioception and neuromuscular control is needed to improve mechanical ankle instability.

The incorporation of prophylactics is also commonly used with athletes who have sustained previous ankle injuries or who are recovering from initial ankle injuries. Delahunt et al<sup>6</sup> state prophylactics have shown to decrease the incidence of ankle injuries, though the exact reasoning is not known.

Due to the high frequency use of ankle prophylactics in sports, how these affect athletic performance have been questioned. Conflicting information has been found on whether or not taping and bracing affect sports performance. Abian-Vicen et al<sup>3</sup> found ankle taping has no effect on jumping or balancing. Macpherson et al<sup>7</sup> found no functional differences between football players with and without ankle bracing during functional activity. However, Mackean et al<sup>8</sup> found decreases in vertical jump and jump shot with female basketball players wearing taping or bracing.

This study will attempt to answer the following questions. Will preference of prophylactic device be dependent upon Athletic Trainers employment setting? Will Athletic Trainers employment setting be dependent upon preference of taping technique to prevent injury? Will Athletic Trainers employment setting be dependent upon preference of taping technique after injury?

## METHODS

The primary purpose of this study was to examine Certified Athletic Trainers use of ankle prophylactics in the prevention and treatment of injury. A comparison of these findings to current recommendations in the literature was drawn. This section will include the following subsections: Research Design, Subjects, Instruments, Procedures, Hypotheses, and Data Analysis.

### Research Design

A descriptive design was used in this study. The dependent variables in this study were taping or bracing and preventing or post-injury prophylactic use. The independent variable was employment setting of Certified Athletic Trainers: high school, high school/clinic, or college.

The strength of this study was that content validity was established for the survey after review by the panel of experts. The limitation of this study was that only Athletic Trainers who are members of the National Athletic Trainers' Association (NATA) were surveyed because not all Certified Athletic Trainers are members of the NATA.

## Subjects

The subjects used for this study were 1000 male and female National Athletic Trainers' Association (NATA) members, with 500 from the college work setting and 500 from the high school or high school/clinic setting. Participants were randomly selected from the NATA membership roles. Each participant who returned a survey (N = 196) was implying informed consent by returning the survey to the researcher via SurveyMonkey.com.

## Preliminary Research

Prior to distribution of the survey, a review of the survey was conducted using a panel of three experts (Appendix C1). This panel reviewed the survey and provided suggestions for improvements. The panel included three certified athletic trainers from California University of Pennsylvania.

## Instruments

The Certified Athletic Trainers Use of Ankle Prophylactic Devices Survey (Appendix C2) was used in this study. This survey was developed by the researcher for the purpose of determining the use of ankle prophylactic devices when preventing and treating injury. Basic demographic information was obtained, including work setting, age, and years of experience. The survey also contained questions regarding the type of ankle taping or bracing used by athletic trainers to prevent and treat ankle injuries. In addition, the survey allowed for athletic trainers to provide their reasons for choosing one type of prophylactic device over the other. The survey had 13 questions and took approximately 5 to 10 minutes to complete.

## Procedures

The California University of Pennsylvania's Institutional Review Board was sent the Protection of Human Subjects form (Appendix C3) for approval before the study was conducted. A survey (Appendix C2) was developed by the researcher and was deemed valid after review by a panel of

three experts. The researcher utilized SurveyMonkey.com to create a direct link to the electronic survey. The researcher completed the Research Survey Request Form on the NATA website and it was distributed by the NATA electronically randomizing members who were in the high school, high school/clinic, and collegiate work setting. A cover letter (Appendix C4) was sent with the survey link explaining the purpose of the study to the Certified Athletic Trainers. A link on the cover letter provided the athletic trainers direct access to begin the survey.

The NATA sent the survey to a maximum of 1000 members by email with the cover letter and link to the survey. A follow-up email was also sent by the NATA as a reminder one week after the initial email. The researcher was not given any demographic information or access to the email addresses of the athletic trainers, therefore, the surveys remained anonymous and the identities of the subjects was protected.

## Hypotheses

The following hypotheses were based on previous research and the researcher's intuition based on a review of the literature.

1. Athletic Trainers preference of prophylactic device will be dependent upon employment setting.
2. Athletic Trainers preference of taping technique to prevent injury will be dependent upon employment setting.
3. Athletic Trainers preference of taping technique after injury will be dependent upon employment setting.

## Data Analysis

All data was analyzed by SPSS version 18.0 for windows at an alpha level of 0.05.

1: A 3 (Taping Technique - tape, brace, or both at the same time) X 3 (Certified athletic trainer employment setting - high school, high school/clinic, and college) Chi square test of independence was used to determine if preference of prophylactic device was dependent upon employment setting.

2: A 8 (Taping technique to prevent injury - closed basket weave, open basket weave, spatting, peroneal, fibular, spartan slipper(boot,) subtalar sling, and other) X 3 (Certified athletic trainer employment setting - high school, high school/clinic, and college) Chi square test of independence was used to determine if preference of taping technique to prevent injury was dependent upon employment setting.

3: A 8 (Taping technique after injury - closed basket weave, open basket weave, spatting, peroneal, fibular, spartan slipper(boot,) subtalar sling, and other) X 3 (Certified athletic trainer employment setting - high school, high school/clinic, and college) Chi square test of independence was used to determine if preference of taping technique after injury was dependent upon employment setting.



## Results

The purpose of this study was to examine athletic trainers use of prophylactic devices in the prevention and treatment of ankle injuries. The data was obtained using a survey created by the researcher. This section contains the following subsections: Demographic Data, Hypothesis Testing, and Additional Findings.

### Demographic Data

A sample of 1000 certified athletic trainers, who are members of the National Athletic Trainers' Association, were randomly selected to participate in the survey. Of the 1000 asked to participate, 196 responded and completed the survey. According to Patten,<sup>9</sup> based on the population of athletic trainers who indicated they work in the collegiate or high school setting, a sample size of 375 was needed. This indicates a return rate of 52.4%. Table 1 represents general characteristics associated with the athletic trainers and Table 2 represents the gender classifications.

Table 1. Demographics of Athletic Trainers

<b>Characteristic</b>	<b>Range</b>	<b>Mean <math>\pm</math> SD</b>
Age	22-64	36.9 $\pm$ 11.3
Years of Experience	0.5-41	13.3 $\pm$ 10.3

Table 2. Gender Classification

<b>Classification</b>	<b>Frequency</b>	<b>Percent</b>
Male	85	43.4
Female	111	56.6

Table 3 represents the highest level of education completed by the athletic trainer.

Table 3. Highest Level of Education

<b>Classification</b>	<b>Frequency</b>	<b>Percent</b>
Bachelor's Degree	56	28.9
Master's Degree	132	68.0
Doctoral Degree	6	3.1

Table 4 represents the classification of work setting for the athletic trainers.

Table 4. Work Setting Classification

<b>Classification</b>	<b>Frequency</b>	<b>Percent</b>
College	115	58.7
High School	46	23.5
High School/Clinic	35	17.8

Table 5 represents athletic trainers' preference of ankle prophylactic device after an acute ankle injury. Participants were asked to choose between the three options available of ankle taping, ankle brace, or both at the same time when treating an acute ankle injury.

Table 5. Prophylactic Device Preference

<b>Classification</b>	<b>Frequency</b>	<b>Percent</b>
Taping	68	37.6
Brace	15	8.3
Both at same time	98	54.1

Table 6 represents the most commonly used ankle taping to prevent injury. Subjects were asked to choose the ankle taping type that they use most commonly for preventative purposes. The following preferences elicited a percent less than 1: Spatting and Fibular. The "Other" preference included: subject does not perform preventative ankle taping, Stirrup 8, and subject prefers ankle braces to taping.

Table 6. Most Commonly Used Ankle Taping To Prevent Injury

<b>Classification</b>	<b>Frequency</b>	<b>Percent</b>
Closed basket weave	148	85.5
Open basket weave	5	2.9
Peroneal	4	2.3
Spartan Slipper (boot)	2	1.2
Subtalar Sling	5	2.9
Other	8	4.6

Participants were asked to choose which ankle taping they most often choose after an ankle injury has occurred. Table 7 represents this data. The following preferences elicited a percent less than 1: Spatting and Fibular. The "Other" response included: Modified Closed basket weave with stiffer tape, depends on type and severity of ankle injury, and a combination of subtalar sling and open basket weave.

Table 7. Most Commonly Used Ankle Taping After Injury

<b>Classification</b>	<b>Frequency</b>	<b>Percent</b>
Closed basket weave	112	65.5
Open basket weave	21	12.3
Peroneal	6	3.5
Subtalar Sling	9	5.3
Spartan Slipper (boot)	16	9.4
Other	5	14.8

Table 8 represents the most common ankle brace type chosen by athletic trainers to prevent injury.

Table 8. Most Commonly Used Ankle Brace To Prevent Injury

<b>Classification</b>	<b>Frequency</b>	<b>Percent</b>
Lace-up	159	88.3
Semi-rigid	16	8.9
Air/Gel Bladder	1	0.6
Rigid	4	2.2

Table 9 represents the most commonly used ankle brace type chosen by athletic trainers after an ankle injury has occurred.

Table 9. Most Commonly Used Ankle Brace After Injury

<b>Classification</b>	<b>Frequency</b>	<b>Percent</b>
Lace-up	115	63.9
Semi-rigid	29	16.1
Air/Gel Bladder	23	12.8
Rigid	13	7.2

Table 10 represents the most commonly used ankle brace brand used by athletic trainers. Participants were asked to choose one of the options to represent their preference in ankle brace brands. The following preferences elicited a percent less than 1: Össur Americas (Gameday, Exoform, etc), Pro-Tech Athletics, and Everlast Ultra. The response "Other" included: Hely Weber, Bioskin - Trilok, Malleoloc, and it varies depending on what the athlete can afford.

Table 10. Most Commonly Used Ankle Brace Brand

<b>Classification</b>	<b>Frequency</b>	<b>Percent</b>
Med Spec (ASO)	81	47.4
Active Ankle Systems, Inc	16	9.4
Swede-O, Inc	15	8.8
DJO (DonJoy, Aircast, Empi, etc)	9	5.3
McDavid	34	19.9
Cramer	10	5.8
Other	4	2.3

Participants were asked during the survey to indicate by answering yes or no whether or not they use the various materials in their standard ankle taping. They were also asked to provide other materials that they often use if they were not one of the choices. These materials included: Powerflex, heel and lace pads, and kinesiotape. This data is represented in Table 11.

Table 11. Materials Used in an Ankle Taping

<b>Classification</b>	<b>Frequency</b>	<b>Percent</b>
Athletic White Tape		
Yes	172	99.4
No	1	0.6
Heavy-weight/ Elastikon tape		
Yes	112	73.7
No	40	26.3
Light-weight stretchy tape		
Yes	75	54.3
No	63	45.7
Mole Skin		
Yes	80	56.7
No	61	43.3
Leukotape		
Yes	18	15.4
No	99	84.6
Pre-Wrap		
Yes	161	96.4
No	6	3.6

Table 12 represents the various reasons that athletic trainers chose to justify their preference of ankle prophylactic.

Table 12. Reasons for Ankle Prophylactic Taping, Bracing, or Both at the Same Time

<b>Classification</b>	<b>Frequency</b>	<b>Percent</b>	<b>P Value</b>	<b><math>\chi^2</math></b>
Subject's knowledge of the literature				
Yes	108	67.5	.000	18.789
No	52	32.5		
Budgetary limits				
Yes	74	47.7	.522	.410
No	81	52.3		
Athlete preference				
Yes	102	65.0	.000	13.392
No	55	35.0		
Personal opinion/experience?				
Yes	165	98.8	.000	156.214
No	2	1.2		
Provides more stability than the other choices?				
Yes	125	79.1	.000	52.082
No	33	20.9		
Prevents injury or re-injury better than the other choices?				
Yes	118	74.7	.000	35.377
No	40	25.3		
Preference is easier to apply or does not take as much time to apply as the other choices?				
Yes	43	28.1	.000	30.026
No	110	71.9		
It is how the subject was taught and/or how all of his or her peer AT's choose				
Yes	68	43.6	.129	2.299
No	88	56.4		
Other	6			

## Hypothesis Testing

All hypotheses were tested an alpha level of .05.

Hypothesis 1: A 3 (Preference of prophylactic Device - tape, brace, or both at the same time) X 3 (Certified athletic trainer employment setting - high school, high school/clinic, and college) Chi square test of independence was used to determine if preference of prophylactic device was dependent upon employment setting. A significant interaction was found ( $\chi^2 = 15.13, P < 0.01$ ).

Conclusion: Athletic trainers in the collegiate setting were more likely to use both bracing and taping at the same time after an acute ankle injury than athletic trainers in the high school and high school/clinic settings (Table 13).

Table 13. 3x3 Chi-Square Independence Test for preference of prophylactic device/athletic trainer employment setting

<b>Classification</b>	<b>Both at same time</b>	<b>Taping</b>	<b>Brace</b>	<b><math>\chi^2</math></b>	<b>P Value</b>
College	54	48	4	15.13	.004
High School	28	11	4		
High School/ Clinic	16	9	7		



Hypothesis 2: A 7 (Taping technique to prevent injury - closed basket weave, open basket weave, peroneal, fibular, spartan slipper(boot,) subtalar sling, and other) X 3 (Certified athletic trainer employment setting - high school, high school/clinic, and college) Chi square test of independence was used to determine if preference of taping technique to prevent injury was dependent upon employment setting. The choice of spatting was not included in the test because no subjects chose that option. A significant interaction was found ( $\chi^2 = 29.272$ ,  $P < 0.01$ ).

Conclusion: Athletic trainers in the collegiate setting were more likely to use the closed basket weave taping technique for prevention of injury than high school and high school/clinic athletic trainers (Table 14).

Table 14. 7x3 Chi-Square Independence Test for preference of taping technique to prevent injury/athletic trainer employment setting

<b>Taping Technique</b>	<b>College</b>	<b>High School</b>	<b>High School/Clinic</b>	<b><math>\chi^2</math></b>	<b>P Value</b>
Closed Basket weave	93	33	22	29.272	.004
Fibular	0	1	0		
Open Basket Weave	3	2	0		
Peroneal	0	0	4		
Spartan Slipper (boot)	1	0	1		
Subtalar Sling	2	2	1		
Other	3	2	2		

Hypothesis 3: An 8 (Taping technique after injury - closed basket weave, open basket weave, spatting, peroneal, fibular, spartan slipper(boot,) subtalar sling, and other) X 3 (Certified athletic trainer employment setting - high school, high school/clinic, and college) Chi square test of independence was used to determine if preference of taping technique after injury was dependent upon employment setting. No significant relationship was found ( $\chi^2 = 17.226$ ,  $P > 0.05$ ).

Conclusion: Athletic trainers' preference of taping technique after an ankle injury is not dependent upon employment setting (Table 15).

Table 15. 8x3 Chi-Square Independence Test for preference of taping technique after injury/athletic trainer employment setting

<b>Taping Technique</b>	<b>College</b>	<b>High School</b>	<b>High School/Clinic</b>	<b><math>\chi^2</math></b>	<b>P Value</b>
Closed Basket weave	65	30	17	17.226	.244
Fibular	0	2	1		
Open Basket Weave	11	5	5		
Peroneal	4	0	1		
Spartan Slipper (boot)	12	0	4		
Spatting	0	0	1		
Subtalar Sling	5	2	2		
Other	18	7	4		

### Additional Findings

In addition to hypothesis testing, additional tests were performed. For the first additional finding, a Chi Square Goodness of Fit tests were calculated comparing the frequency (yes or no) for reasons athletic trainers chose for their preference of prophylactic device. The following reasons were selected by athletic trainers as "yes" for significant results: Subjects knowledge of the literature ( $\chi^2 = 18.789, P < 0.01$ ); Athlete preference ( $\chi^2 = 13.392, P < 0.01$ ); Personal opinion/experience ( $\chi^2 = 156.241, P < 0.01$ ); provides more stability than other choices ( $\chi^2 = 52.082, P < 0.01$ ); and prevents injury better than the other choices ( $\chi^2 = 35.377, P < 0.01$ ). The following reason was selected by athletic trainers as no for significant results: preference is easier to apply or does not take as much time to apply as other choices ( $\chi^2 = 30.026, P < 0.01$ ). No significant results were found for "Budgetary limits" and "It is how the subject was taught and/or how all of his or her peer AT's choose". Refer to Table 12 for statistical results.

The second test performed was a Chi-Square Test of Independence comparing employment setting with preference of brace type after injury. A significant interaction was

found ( $\chi^2 = 12.58, P = 0.05$ ). Athletic trainers in the collegiate setting chose the lace-up type while the other employment settings did not (Table 16).

Table 16. 3x3 Chi-Square Independence Test for preference of brace type after injury/athletic trainer employment setting

<b>Brace Type</b>	<b>College</b>	<b>High School</b>	<b>High School/Clinic</b>	<b><math>\chi^2</math></b>	<b>P Value</b>
Lace-up	64	29	22	12.58	.050
Air Gel/Bladder	19	1	1		
Semi-Rigid	16	8	8		
Rigid	7	5	1		

## DISCUSSION

This study has produced a number of findings related to the use of prophylactic devices. The following section will discuss these findings and is divided in the following subsections: Discussion of Results, Conclusions, and Recommendations.

### Discussion of Results

This study focused on the athletic trainers' preference of prophylactic devices before and after an ankle injury. Ankle injuries are very common orthopedic injuries that may lead to chronic ankle instability. These injuries may cause athletic trainers to recommend and use prophylactic devices in order to prevent or treat injuries. The researcher examined different demographic information such as work setting, gender, and years of experience to determine if it affected their preference of prophylactic device.

The researcher's first hypothesis focused on the belief that preference of prophylactic device would be dependent upon employment setting. There was no previous research performed examining athletic trainers preference

of prophylactic devices. Based on the researchers own experience and intuition, one might believe athletic trainers from the collegiate setting would be more likely to use tape or bracing than athletic trainers in a high school or high school/clinic setting. It was determined athletic trainers who work in the collegiate setting were more likely to use prophylactic devices after an acute ankle injury than those who work in a high school or high school/clinic setting. These results are similar to the study completed by Mickel et al<sup>10</sup> which stated the use of bracing as cost effective, as well as the best method to prevent injury versus tape. The researchers recommended bracing over taping, however the results of this study indicated that athletic trainers chose to use both bracing and taping. One of the reasons for this may be attributed to comfort for the athlete. Reuter et al<sup>11</sup> surveyed the participants of their study to describe which prophylactic device is more stable and more comfortable. The researchers found taping to be more stable but less comfortable while bracing was found to be more comfortable but less stable. The athletic trainers' preference of using both tape and bracing could be attributed to both aspects: comfort and stability.

The second hypothesis examined in this study stated athletic trainers' preference of ankle taping technique to prevent injury will be dependent upon employment setting. The researcher hypothesized athletic trainers in the collegiate setting would be more likely to use a standard ankle taping than the other employment settings. There is no previous research to indicate if taping technique preference changes with employment setting; however, from the researcher's prior experience, there seems to be a difference because of a variety of reasons.

The results coincide with the hypothesis indicating that collegiate athletic trainers use a closed basket weave. There have been previous studies completed that indicate certain taping techniques are more efficient and stable than others. Abian-Vicen et al<sup>12</sup> found taping with elastic tape (elastikon, Powerflex) and inelastic tape provided the same amount of restricted range of motion and stability, but elastic was found to be more comfortable. Abian-Vicen et al<sup>12</sup> recommended the use of elastic tape because of these reasons. The researchers in this study found a significant majority of athletic trainers chose an all inelastic tape, which is a direct contradiction to the research. One of the reasons may be related to education,

since standard closed basket weave ankle procedures with inelastic tape is taught first to athletic training students as well as emphasis placed on the effectiveness of this taping procedure.

The third and final hypothesis stated preference of taping technique after injury would be dependent upon employment setting. Again, there has been no previous research to support this specific hypothesis. However, the researcher hypothesized after injury the collegiate employment setting would choose an ankle taping that has different materials generally thought of as stronger taping. However, no significant results were shown to support this hypothesis. With a lack of significance, the results demonstrated athletic trainers from different employment settings do not prefer a certain taping technique after an ankle injury.

In addition to examining the hypotheses, the researcher discovered additional findings by using supplementary demographic and preference questions. The first additional finding examined athletic trainers reasons for choosing their preference of ankle prophylactic. There were a number of significant findings when a majority of athletic trainers chose similar reasons. The significant



reasons were: subject's knowledge of the literature, athlete preference, personal opinion/experience, preference provides more stability than other choices, preference prevents injury or re-injury better than the other choices, and lastly the preference is easier to apply or does not take as much time to apply. The two reasons that did not yield significant results were: budgetary limits and chosen preference based on skills learned or peer choice.

The second additional finding used athletic trainers' employment setting and their preference of brace type after an ankle injury. There were significant results indicating that athletic trainers in the collegiate setting chose a lace-up brace while others in the high school and high school/clinic settings did not. This finding coincides with research completed by Rezens et al,<sup>13</sup> which found that lace-up ankle braces were found to be more supportive and preferred by athletes.

## Conclusions

The results of this study both support and oppose the results of previous studies. The overall results indicated that athletic trainers chose both bracing and taping after an acute injury, which did not defend Mickel et al<sup>10</sup> who found that bracing is more stable and cost effective. Based on the results of this study, the researcher can conclude athletic trainers have similar preferences of prophylactic devices in the collegiate setting. This could be a credit to similarity of the college level, the maturity level of athletes, the increased risk of injury, or a number of reasons.

## Recommendations

The results of this study demonstrated athletic trainers chose standard closed basket weave ankle tapings and the use of a brace after an ankle injury. In order to aid in determining if employment setting changes the way athletic trainers chose a prophylactic device, future research is suggested. For example, in the collegiate setting, athletic trainers could specify their NCAA

division level of I, II, or III and in the high school setting, athletic trainers could choose their classification of A, AA, AAA, etc.

In addition, further research should obtain more information about the reasons athletic trainers chose their preference. Another follow-up study might focus more on athlete preferences of prophylactic devices by gender, sport, and athletic level, then compare to the athletic trainer preferences.

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APPENDICES

APPENDIX A

Review of Literature

## REVIEW OF LITERATURE

Ankle injuries are one of the most common athletic injuries. Because of the high incidence rate, health care providers, including athletic trainers, physicians, and orthopedic surgeons, have turned to the use of prophylactic devices to rehabilitate and prevent injury and re-injury. The prophylactic devices most commonly used are ankle taping and bracing. Multiple types of ankle tapings and braces can be used by an athletic trainer, but there has been little research on which type is preferred or most popular.

The purpose of this Review of Literature is to enlighten the reader on previous work examining the use of tape by athletic trainers and their preferences in taping and bracing types when preventing or rehabilitating an ankle injury. This will be accomplished in the following sections: Importance and Background of Ankle Prophylactics, Clinical Practice of Taping and Bracing, and Ankle Taping and Bracing. Each section will be further divided into subsections as well. Under the Importance and Background of Ankle Prophylactics, the Mechanism and Frequency of Ankle Injuries, Chronic Ankle Instability, and Prevention of Ankle Injuries will be discussed; Clinical Practice of



Taping and Bracing will include Types of Ankle Taping and Bracing as well as Clinical Education; and lastly, Ankle Taping and Bracing will discuss the Effects on Functional Performance and Reliability of Injury Prevention. A summary of the review of literature is also provided.

### Importance and Background of Ankle Prophylactics

#### Mechanism and Frequency of Ankle Injuries

Acute ankle injuries are the most commonly occurring injury during athletic-related activities. These injuries make up approximately 38% - 50% of all injuries reported.<sup>1</sup> According to Robbins and Waked,<sup>2</sup> the most common type of ankle injury is a lateral ligamentous sprain, accounting for about 85% of injuries. The ankle is the least stable in the open packed position of plantar-flexion and inversion, which is how most ankle injuries occur.<sup>2</sup> Mechanisms of ankle sprains also differ by sport. In football, the most common mechanism is contact with another player, while in basketball it is landing from a rebound or jump.<sup>3</sup> The inversion and plantarflexion mechanism causes the anterolateral structures to be stretched which makes the ankle far less stable and increases the risk of re-injury. Repeated stretching of these structures in the ankle can

lead to instability and the need for the use of prophylactic devices.

According to Robbins and Waked,<sup>2</sup> ankle sprains occur because footwear causes a decrease in one's foot position awareness compared to when barefoot as well as changes in the foot position resulting in an increase in chance of injury. Wearing braces or taping helps to correct the foot back to its normal position which helps decrease the chance of injury. However, the researchers concluded that taping and bracing also decrease the range of motion ankles have, which may increase the chances of re-injury. Their final conclusion is that the active population should find correct footwear that does not alter foot kinematics and position awareness so ankle injuries can be prevented without limiting range of motion. Hubbard and Hertel<sup>4</sup> also concluded that both hypermobility and hypomobility at the talocrural, subtalar, and inferior tibiofibular joints can significantly contribute to chance of injury/re-injury.

The frequency of ankle injuries also varies by sport. According to a study completed by Nelson et al<sup>3</sup> the researchers investigated the prevalence of ankle injuries by sex, type of exposure, and sport. One hundred high schools across the country submitted their injury data from the 2005-2006 school year. Using the injury surveillance

system, the researchers collected data about ankle injury type, athletes' sex, and sport. The results indicated that ankle injuries occurred at a much higher rate during competition than in practice. In addition, the sports with the most incidences were, from highest to lowest, boys' basketball, then girls' basketball, and finally football. The researchers concluded that sports with jumping in close proximity to others and with quick changes of direction were the most often associated with ankle injuries.<sup>3</sup> Nelson et al<sup>3</sup> also noticed a significantly higher number of injury occurrences during competition than in practice in all sports except for women's volleyball.

#### Chronic Ankle Instability

Along with the high incidence of ankle injuries in physical activity, a high occurrence of re-injury to the ankle is also an area of great concern to athletic trainers. Re-injury rates have been recorded as high as 80% in the active population.<sup>5</sup> Because of this high rate, individuals who have suffered multiple consecutive ankle injuries in addition to continuous symptoms such as instability in the ankle are diagnosed with chronic ankle instability.<sup>5,6</sup>

The presence of chronic ankle instability is thought to be due to mechanical ankle instability (MAI) and functional ankle instability (FAI).<sup>4,5</sup> MAI refers to the occurrence of excessive ankle range of motion due to laxity in the ligamentous structures, namely the anterior talofibular and calcaneofibular ligaments.<sup>5,7</sup> It also includes arthrokinematic restrictions, degenerative changes, and synovial changes.<sup>5,7</sup> MAI instability affects all the joints associated with the ankle including the subtalar, talocrural, and inferior tibiofibular joints.<sup>7</sup> FAI components include decreased proprioception, neuromuscular control, strength, and postural control.<sup>5,7</sup> All these components are implemented into ankle rehabilitation programs to help decrease re-injury rates. Studies conflict with whether or not FAI and MAI occur simultaneously with an ankle injury, however it is generally accepted that the two types of instability are apparent with most cases of CAI.<sup>5</sup>

Chronic ankle instability has been found to not only solely affect kinematics of the ankle, but also the rest of the lower extremity kinetic chain.<sup>8</sup> Time to stabilization upon landing after jumping has been found to be increased with chronic ankle instability with knee and hip flexion landing angles to be decreased.<sup>8</sup> Gribble and Robinson<sup>8</sup>

completed a study in order to examine the contributions of lower extremity kinematics during an assessment of dynamic stability in people with chronic ankle instability. The subjects were separated into groups (those with CAI and those without), but all completed three drop landing tests while their ankle plantarflexion, knee flexion, and hip flexion were measured at the point of impact; ground reaction force data was also collected. The results indicated that the subjects with CAI had decreased dynamic stability in addition to a decreased knee flexion angle. The researchers concluded that decreased amount of knee flexion and dynamic stability could cause an increase in re-injury rates.<sup>8</sup> Further research is also suggested to determine if prophylactic devices and various ankle rehabilitation programs could enhance the kinematic pattern of the lower extremity.<sup>8</sup>

In a study completed by Delahunt et al,<sup>5</sup> participants were all CAI sufferers. The researchers wanted to determine which type of taping (lateral subtalar sling or fibular repositioning) could enhance dynamic postural stability in patients with chronic ankle instability. The participants completed the Star Excursion Balance test under three conditions: no tape, lateral subtalar sling taping, and fibular repositioning taping. The researchers concluded

that neither taping condition increased nor decreased the stability of the ankle. In addition, the subjects reported an increase in feelings of stability and reassurance when wearing the lateral subtalar sling taping over the fibular repositioning taping.<sup>5</sup>

The use of prophylactics has been shown to decrease the incidence rate of ankle injuries, although the exact reasoning is not known.<sup>5</sup> Possible factors that ankle taping and bracing could help improve for MAI included joint arthrokinematic stabilization and chronic laxity and for FAI taping and bracing could aid in providing increases in proprioception and neuromuscular control.<sup>5</sup> There have been numerous studies completed investigating these possible reasons, although research has not been consistent.

#### Prevention of Ankle Injuries

As previously stated, ankles are commonly injured. Because of this, the prevention of ankle injuries is extremely important to be able to keep athletes on the field. Most health care providers agree that establishing excellent neuromuscular control, proprioception, and strengthening are needed to increase dynamic stability and prevent re-injury.<sup>2</sup> Vaes et al<sup>9</sup> completed a study that followed volleyball teams throughout a whole season. They

were separated into two groups: control and testing. The testing group was given a balance board training program to complete and the control did not, and injury reports were then recorded. The results showed a significant decrease in the amount of ankle injuries in the testing group as well as a significant reduction in ankle sprain risk, but for only those with a history of injury. The researchers concluded that the use of this balance board program is effective in preventing ankle sprains and re-injury.<sup>9</sup>

Similarly, following an ankle injury, athletes need to re-establish the same characteristics. After injury, there are certain neurological deficits that need to be addressed. However, until this can be established, the use of ankle prophylactics may be needed for added support. According to Hubbard and Kaminski,<sup>10</sup> ankle injuries cause a decrease in kinesthesia and proprioception. In this study, subjects with decreased kinesthesia caused by an ankle injury were tested under three conditions to determine if kinesthesia could be increased using taping or bracing. The participants were tested on a kinesthesia measurement system while wearing no prophylactic devices, taping, and two types of braces. The results indicated that the kinesthesia measurements were significantly better in the unbraced condition than in the two braced conditions, but

not the taping condition. The researchers concluded that bracing caused a decrease in kinesthesia awareness in the lower extremity, but stated that much more research needs to be done to determine the exact affect taping and bracing has on kinesthesia.<sup>10</sup>

Vaes et al<sup>9</sup> investigated the effectiveness of external support on stabilization. They tested strapping, taping, and nine different braces. Once applied to the ankle, the talar tilt was measured in comparison to no support to find out the differences. The results indicated that taping and two of the nine braces significantly decreased the talar tilt levels. The researchers concluded that there should be three levels of effectiveness when referring to lower extremity external support and the effectiveness of this support should be determined before using it to treat or prevent ankle injuries.<sup>9</sup>

Refshauge et al<sup>11</sup> determined whether or not proprioception is affected in people who have frequent ankle sprains. In addition, the researchers wanted to know if wearing ankle braces would help to increase the proprioception back to normal. Subjects (separated into recurrent sprains and no sprains) were tested with both tape and no tape on their proprioceptive abilities. The



results concluded that there were no significant differences between the two groups.<sup>11</sup>

## Clinical Practices of Taping and Bracing

### Types of Ankle Taping and Bracing

Several different kinds of ankle tapings and bracings are commonly used by athletic trainers. However, there has been minimal research on which type of taping or bracing is most reliable or most preferred.

Rezents<sup>12</sup> compared two types of ankle braces to determine which is better for athletic performance. The ankle braces used were Active Ankle and ASO lace-ups. The researcher measured all ranges of motion with and without the braces. The results indicated that the ASO brace had a greater decrease in ROM than the Active Ankle. In addition, when the athletes were surveyed, 93% stated they preferred the ASO brace because it felt more secure.

Pope et al<sup>13</sup> compared four types of ankle tapings. The taping techniques used were: taping with no figure eight, taping with figure eights, taping with no heel locks, taping with heel locks. They were applied to a model of the human ankle joint and then subjected to functional tests on a mechanical testing machine. The tests included

determining how far the ankle ROM could go before subjecting it to injury, torque to failure, and deflection. It was previously determined that eight degrees of angular deflection causes pain and that torques of 420 nanometers could be applied before injury occurs. The researchers determined that the ankle taping that included figure eights was the best. It was the only method that had the strength to withstand the most exterior forces than the other tapings and it was recommended over the others.<sup>13</sup>

In a similar study Abián-Vicén et al<sup>14</sup> compared two types of ankle tapings. The purpose was to determine the level of fatigue for two types of tape after a 30 minute exercise session. The participants were tested with no tape, an elastic tape, and an inelastic tape. Measurements of ankle passive range of motion (PROM) were taken before and after exercise. The subjects were also asked about their level of comfort and restriction provided by the tape. The researchers found that after the exercise session there was less restriction in ankle plantarflexion and inversion for both types of tape, but that the subjects perceived the elastic tape as more comfortable and less restrictive.<sup>14</sup> The researchers recommended using elastic tape over inelastic tape because range of motion was

restricted the same for both types, but elastic was preferred by athletes.<sup>14</sup>

### Clinical Education

To become a Certified Athletic Trainer, one must first enroll into an Accredited Athletic Training Education Program. In this program, students complete competencies and proficiencies in order to obtain the skills needed to graduate and become certified. According to the National Athletic Trainers' Association, athletic training educational competencies are "the minimum requirements for a student's entry level education."<sup>15(p.2)</sup> The Commission on Accreditation of Athletic Training Education separated the competencies into twelve content areas and are the foundation of a student's education.<sup>16</sup> One of these content areas is Risk Management and Injury Prevention. Under this content area, students become proficient in taping and proper administrations of bracing for prevention and treatment of injuries.

The Commission on Accreditation of Athletic Training Education (CAATE) along with the National Athletic Trainers Association developed the standards and educational competencies that all Certified Athletic Trainers must learn.<sup>15,16</sup> According to CAATE, students must complete a

competency pertaining to fitting a brace properly. Students must "appropriately select and fit appropriate standard protective equipment on the patient for safe participation in sport and/or physical activity to prevent/minimize the risk of injury to head, torso, spine, and extremities."<sup>16(p.5)</sup> A certified athletic trainer must know how to use a variety of different braces for every joint in the body as well as the advantages and disadvantages of using them to be able to implement using prophylactic braces on athletes.<sup>16</sup>

There are taping competencies created by CAATE for athletic training students as well. Certified athletic trainers will be able to "explain, fabricate, and apply appropriate preventative taping and wrapping procedures...Procedures and devices should be consistent with sound anatomical and biomechanical principles."<sup>16(p.5)</sup> All of these competencies are created to not only make sure that all athletic training students receive the same education, but they also serve to set a foundation for students' education.

## Ankle Taping and Bracing

### Effects on Functional Performance

High rates of ankle injury have caused many athletes and athletic trainers to use protective equipment in order to prevent an initial injury or a re-injury. The most common methods for the ankle are a standard ankle tape or ankle brace. There have been multiple studies conducted on the functional performance of athletes who wear these protective measures. The factors most often compared are speed, agility, vertical jump, and balance performance. Recently, there have been conflicting results between studies on functional activities being affected by taping or bracing.

A study completed by Abián-Vicén et al<sup>1</sup> tested the effects of ankle taping on balance and jump tests. All subjects completed three tests with both tape and without tape. The results indicated no significant differences between the two testing groups. The researchers concluded that preventative taping measures do not affect the balance and jumping abilities of young, healthy athletes.<sup>1</sup>

There have also been studies<sup>7,8</sup> that have been completed on the use of prophylactic taping and bracing on certain sports. These studies were conducted in basketball

and football. Macpherson et al<sup>7</sup> compared the effects of softshell and semirigid prophylactic ankle stabilizers on male football players' functional performance in speed, agility, and vertical jump. They concluded that neither of the ankle stabilizers caused a difference in speed, agility, or vertical jump.<sup>7</sup>

In a similar study, MacKean et al<sup>17</sup> compared bracing and taping on functional performance of female basketball players. The athletes were evaluated in basketball-related activities (sprint, jump shot, and vertical jump) in five different scenarios: no tape, preventative taping, and three different types of bracing. Overall, the results indicated that taping and bracing did slightly affect the subjects' abilities in basketball-related drills. Vertical jump and jump shot were decreased when the athletes wore tape and braces. This led the researchers to believe that the protective measures caused adverse reactions in female basketball players.<sup>17</sup>

Hardy et al<sup>18</sup> and Ozer et al<sup>19</sup> investigated the effectiveness of ankle prophylactics on balance and proprioception. Hardy et al<sup>18</sup> had each participant complete three Star Excursion balance tests while wearing no brace, a semi-rigid brace, and a lace-up ankle brace. The Star Excursion balance tests consist of maintaining balance

while moving opposite leg in eight different directions. The researchers concluded that bracing had no effect at all on the balance during reaching tasks.<sup>18</sup> Similarly, Ozer et al<sup>19</sup> measured the effectiveness of not only bracing but ankle taping on balance, jumping, coordination, and proprioception. Each participant was tested for each variable while wearing no ankle devices barefoot, braces, and tapings. The results indicated that there were no significant differences between the braces or taping when compared to barefoot measures on any of the variables tested. The researchers concluded that either method is useful in preventing ankle injuries without altering functional performance.<sup>19</sup> Both of these articles measured similar functional performance, yet they arrived at different conclusions.

In addition to research that has been performed to date on ankle prophylactic affects on functional performance, there has been some research on the perceptions and/or placebo affect that may accompany these devices. Reuter et al<sup>20</sup> compared four types of prophylactic devices (spatting, taping, bracing, and no taping/bracing) on athletes wearing football cleats. The researchers studied measurements of functional performance (maximal effort sprint and cutting drill) and feelings of comfort

and stability. The results found that the subjects perceived no support or the bracing as more comfortable and stable than either taping or spitting in the sprint, but found that no support was far less stable in the cutting drills than the other three conditions. There were no performance differences between any of the conditions. This led the researchers to conclude that spitting does not affect performance, is the same as taping in stability and comfort, and the same as bracing in stability but not comfort.<sup>20</sup>

Sawkins et al<sup>21</sup> wanted to find out if there was a placebo effect in athletes who wear ankle taping and believe they will not be reinjured. The participants were tested under three conditions: no tape, real tape, and a placebo tape. They completed the Star Excursion balance test and a hopping test. The results indicated that there were no differences between the conditions in the functional tests. However, the researchers found that the subjects felt more confidence, stability, and reassurance when wearing both the placebo tape and the real tape. The researchers did not come to an actual conclusion, but stated that further research needs to be done in this area to determine if there is a placebo effect.<sup>21</sup>



### Reliability of Injury Prevention

The effectiveness of tape has long since been debated in research, with some experts saying that after a period of time the tape loosens up and is not effective any longer. In one study, Meana et al<sup>22</sup> aimed to compare the effectiveness of ankle taping after a 30 minute training session. Ankle ROM was recorded before and after the training session. The results indicated that there was almost 50% decrease in ROM after the training session. The researchers concluded that further testing needs to be done in order to determine the effectiveness of wearing ankle taping in those who have no history of ankle injury.<sup>22</sup>

Another study completed by Delahunt et al<sup>23</sup> examined the effects of a standard ankle taping on ankle joint movement in the frontal and sagittal plane on patients with chronic ankle instability. Each subject completed three drop landing tests under three conditions: no tape, taping, and post-exercise taping. The results indicated that there were no significant differences between pre and post exercise taping. Both taping conditions caused a decrease in the amount of plantarflexion after the drop landings. The researchers concluded that ankle taping may help to increase stability in the ankle.<sup>23</sup>

Mickel et al<sup>24</sup> compared the use of bracing versus taping and the incidence of ankle sprains in one season of high school football season. The athletes were randomly placed into one of two groups: braced or taped every day. After the season, six ankle sprains had occurred and there was no significant difference between the two variables. In addition, the cost of using tape throughout the season compared to a one-time fee of ankle braces is significantly higher when using tape. The researchers concluded that using braces would be more efficient than using tape.<sup>24</sup>

Similarly, Frey et al<sup>25</sup> completed a study that determined the effectiveness of ankle bracing on the frequency of ankle injuries in high school volleyball players over the course of one season. Subjects were separated into two groups: those who wear braces and those who do not wear braces as the control. The researchers used information about previous injury and sex to determine the results. They found that there were no differences between the frequency of ankle injuries between the two groups.

However, they found that there were difference in protecting against re-injury for those who had a previous injury. The Aircast Sports Stirrup and Active Ankle Trainer II protected against injury with no history, but did not prevent injury to those who had prior history. Also, in the

female group there were significantly more injuries when wearing non-rigid braces compared to more rigid braces. The researchers concluded that this information is very helpful for people deciding on which ankle brace to use in volleyball.<sup>25</sup>

### Summary

The review of literature focuses on the importance and background of ankle prophylactics, clinical practice of taping and bracing, and ankle taping and bracing. Athletic trainers must choose between the two types of ankle prophylactics every day when preventing and treating ankle injuries.

There is very little research that states what the preference of athletic trainers is for ankle prophylactics. However, research does state the similarities and differences between the two types. Both taping and bracing have little to no decrease in functional performance. According to research,<sup>3,7,9</sup> bracing is a better option to use when one focuses on only injury prevention. Bracing tends to keep the foot in more stabilized, closed pack position longer than taping does.<sup>12,22</sup> In addition, bracing is also a better option when looking at a cost standpoint. Buying

individual braces for each ankle is far cheaper than buying several boxes of tape.<sup>24</sup>

Since most of the research points to using bracing over taping as a better option, it is important to see if athletic trainers are following research or using tape more often. There are various other reasons that one would choose either device over the other, which should be determined as well.

APPENDIX B

The Problem

## STATEMENT OF THE PROBLEM

The primary purpose of this study is to examine Certified Athletic Trainers use ankle prophylactics in the prevention and treatment of injury. It is important to examine this relationship because athletic trainers frequently use ankle taping and bracing and have specific reasons as to why they choose one over the other. Finding out if athletic trainers knowledge of the literature associated with ankle prophylactics corresponds with their preference in choosing between them can help to determine why an individual would or would not choose one device over the other. Additionally it would be beneficial for athletic trainers to assess their knowledge of the research and if they are up to date.

### Definition of Terms

The following definitions of terms will be defined for this study:

- 1) Ankle Prophylactics - referring to types of ankle taping, bracing, or both completed for the prevention of injury<sup>26</sup>

- 2) Functional Performance - an individual's personal skill in the following aspects: jumping, running, sprinting, balance, and agility<sup>26</sup>
- 3) Proprioception - the unconscious perception of movement and spatial orientation arising from stimuli within the body itself<sup>26</sup>
- 4) Neuromuscular Control - pertaining to stability and balance of both nerves and muscles<sup>26</sup>
- 5) Spatting - use of taping to prevent ankle injuries on the outside of a shoe<sup>26</sup>

#### Basic Assumptions

The following are basic assumptions of this study:

- 1) All respondents will answer the survey honestly to the best of their ability.
- 2) All respondents will be given adequate time to complete the survey.
- 3) There will be an adequate return rate.

#### Limitations of the Study

The following are possible limitations of the study:

- 1) Only surveying Certified Athletic Trainers in high school and collegiate settings.

- 2) Only surveying Certified Athletic Trainers who are members of the National Athletic Trainers' Association.
- 3) Opinions/knowledge may be skewed by the Athletic Trainers educational background.
- 4) Incorrect names or email addresses of Athletic Trainers could be included in the list serve.

### Significance of the Study

Athletic trainers must choose between the two types of ankle prophylactics every day when preventing and treating ankle injuries. There is very little research that states what the preference of health care professionals is for ankle prophylactics. Both taping and bracing have little to no decrease in functional performance. According to research, bracing is a better option to use when one focuses on only injury prevention.<sup>3,7,9</sup> Bracing tends to keep the foot in more stabilized, closed pack position longer than taping does.<sup>12,21</sup> In addition, bracing is also a better option when looking at a cost standpoint.<sup>23</sup> Buying individual braces for each ankle is far cheaper than buying several boxes of tape.

Since most of the research points to using bracing over taping as a better option, it is important to see if



athletic trainers are following research or using tape more often. There are various other reasons that one would choose either device over the other, which should be determined as well.

APPENDIX C

Additional Methods

APPENDIX C1

Panel of Experts Letter

Dear \_\_\_\_\_ :

I am a graduate athletic training student at California University of Pennsylvania pursuing a Master of Science degree in Athletic Training. To fulfill the thesis requirement for this program, I am conducting a descriptive study. The primary purpose of this study is to examine how Certified Athletic Trainers use ankle prophylactics in the prevention and treatment of injury.

In order to increase the content validity of the instrument, a panel of experts has been chosen to review the survey. You have been selected as one of the three professionals to be on this panel. Due to your position and experience, your feedback is very important to the success of this study. The information obtained by this panel of experts review will be used to make revisions and create the final survey to be distributed to the population sample. Your responses are voluntary and will be confidential.

Please answer the following questions based on the attached survey and make any other additional comments you deem appropriate. Please return your comments and revisions via email no later than November 7, 2011. If you have any questions or concerns, please do not hesitate to contact me.

1. Are the questions appropriate, valid, and understandable?
2. Comment on the overall presentation of the survey.
3. Which questions, if any, should be restated from the survey? Why?
4. Which questions, if any, should be added to the survey? Why?

Thank you in advance for your time and efforts.  
Sincerely,

Amber Boyle, ATC  
California University of Pennsylvania

APPENDIX C2

Certified Athletic Trainers Use of  
Ankle Prophylactic Devices Survey

## Demographic Information

**\*1. What is your age?**

**\*2. How many years of experience as a Certified Athletic Trainer do you have?**

**\*3. What is your gender?**

Male

Female

**4. What is the highest level of school that you have completed or the highest degree you have received?**

Bachelor degree

Master's degree

Doctoral degree

Other (please specify)

**\*5. What is your work setting?**

High School

High School/Clinic

College

**\*6. After an acute ankle injury, I would choose an ankle \_\_\_\_\_ to provide more stabilization.**

- Taping
- Brace
- Both at the same time

**7. Choose the ankle taping that you most commonly use to PREVENT injury.**

- Closed Basket weave
- Open Basket weave
- Spatting
- Peroneal
- Fibular
- Spartan Slipper (boot)
- Subtalar Sling

Other (please specify)

**8. Choose the ankle taping that you most commonly use AFTER injury.**

- Closed Basket weave
- Open Basket weave
- Spatting
- Peroneal
- Fibular
- Spartan Slipper (boot)
- Subtalar Sling

Other (please specify)

**\*9. Choose the ankle brace that you most commonly use to PREVENT injury.**

- Lace-up
- Semi-rigid
- Air/Gel Bladder
- Rigid

**\*10. Choose the ankle brace that you most commonly use AFTER injury.**

- Lace-up
- Semi-rigid
- Air/Gel Bladder
- Rigid

**11. Choose the ankle brace brand that you most commonly use:**

- Med Spec (ASO)
- Active Ankle Systems, Inc
- Swede-O, Inc
- DJO (DonJoy, Alrocast, Empl, ect)
- McDavid
- Everlast Ultra
- Cramer
- Pro-Tech Athletics
- Ossur Americas (Gameday, Exoform, etc)

Other (please specify)



**Choose yes or no for the following questions.**

**\* 12. When taping an ankle, do you use the following:**

	yes	no
Athletic white tape	<input type="radio"/>	<input type="radio"/>
Heavy-weight/Elastikon tape	<input type="radio"/>	<input type="radio"/>
Light weight stretchy tape	<input type="radio"/>	<input type="radio"/>
Mole Skin	<input type="radio"/>	<input type="radio"/>
Leukotape	<input type="radio"/>	<input type="radio"/>
Pre-wrap	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="text"/>	

**\* 13. Did you choose your preference of ankle taping, bracing, or both at the same time because:**

	yes	no
of your knowledge of the literature?	<input type="radio"/>	<input type="radio"/>
of budgetary limits?	<input type="radio"/>	<input type="radio"/>
of athlete preference?	<input type="radio"/>	<input type="radio"/>
of personal opinion/experience?	<input type="radio"/>	<input type="radio"/>
it provides more stability than the other choices?	<input type="radio"/>	<input type="radio"/>
it prevents injury or re-injury better than the other choices?	<input type="radio"/>	<input type="radio"/>
it is easier to apply or doesn't take as much time to apply as the other choices?	<input type="radio"/>	<input type="radio"/>
that is how you were taught and/or how all your peer AT's do it?	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="text"/>	

Approved by the California University of Pennsylvania IRB

Appendix C3  
Institutional Review Board



California University  
of Pennsylvania

Proposal Number

Date Received

PROTOCOL for Research Involving  
Human Subjects

Institutional Review Board (IRB) approval is required before beginning any research and/or data collection involving human subjects

(Reference IRB Policies and Procedures for clarification)

**Project Title** Athletic Trainers Use of Prophylactic Devices in the Ankle

**Researcher/Project Director** Amber Boyle

**Phone #** 574-274-7504

**E-mail Address** bov7061@calu.edu

**Faculty Sponsor (if required)** Carol Biddington

**Department** Health Science

**Project Dates** December 2011 to April 2012

**Sponsoring Agent (if applicable)** n/a

**Project to be Conducted at** California University of PA (via internet)

**Project Purpose:**  Thesis  Research  Class Project  Other

Keep a copy of this form for your records.

**Please attach a typed, detailed summary of your project AND complete items 2 through 6.**

1. *Provide an overview of your project-proposal describing what you plan to do and how you will go about doing it. Include any hypothesis(es) or research questions that might be involved and explain how the information you gather will be analyzed. For a complete list of what should be included in your summary, please refer to Appendix B of the IRB Policies and Procedures Manual.*

The primary purpose of this study is to examine how Certified Athletic Trainers use ankle prophylactics in the prevention and treatment of injury using the Certified Athletic Trainers Use of Prophylactic Devices Survey.

A survey (Appendix C2) developed by the researcher and reviewed by a Panel of Experts will be sent electronically to Certified Athletic Trainers in the high school and collegiate work settings. The researcher will utilize SurveyMonkey.com to create a direct link to the electronic survey. A cover letter (Appendix C4) will be sent with the survey explaining the purpose of the study to the Certified Athletic Trainers. A link on the cover letter will provide the athletic trainers direct access to begin the survey. The survey will be distributed by the National Athletic Trainers' Association office staff by randomly selecting members who are in the high school, high school/clinic, and/or collegiate work setting. To receive approval from the NATA the researcher completed the Research Survey Request Form on the NATA website. The NATA will send the survey to a maximum of 1000 members by email with the cover letter which includes a link to the survey. A follow-up email will also be sent by the NATA as a reminder one week after the initial email. The researcher will not be given any demographic information or access to the email addresses of the athletic trainers, therefore, the surveys will remain anonymous and the identities of the subjects will be protected.

Hypotheses:

1. Athletic Trainers preference of prophylactic device will be dependent upon employment setting.
2. Athletic Trainers preference of taping technique to prevent injury will be dependent upon employment setting.
3. Athletic Trainers preference of taping technique after injury will be dependent upon employment setting.

All data will be analyzed by SPSS version 18.0 for windows at an alpha level of 0.05. Hypothesis testing will utilize Chi square tests of independence.

2. *Section 46.11 of the Federal Regulations state that research proposals involving human subjects must satisfy certain requirements before the IRB can grant approval. You should describe in detail how the following requirements will be satisfied. Be sure to address each area separately.*
  - a. *How will you insure that any risks to subjects are minimized? If there are potential risks, describe what will be done to minimize these risks. If there are risks, describe why the risks to participants are reasonable in relation to the anticipated benefits.*

No research will be conducted until approval is granted by the IRB. Although the risk is minimal in this study, the possible risk of harm associated with social and behavioral research is social, psychological, and dignitary in nature. Since the responses of each individual are confidential, the risk posed is small.

- b. *How will you insure that the selection of subjects is equitable? Take into account your purpose(s). Be sure you address research problems involving vulnerable populations such as children, prisoners, pregnant women, mentally disabled persons, and economically or educationally disadvantaged persons. If this is an in-class project describe how you will minimize the possibility that students will feel coerced.*

Approved, September 12, 2005 / (updated 02-09-09)

3

The survey will be sent to 1000 randomly selected Certified Athletic Trainers who are members of the National Athletic Trainers' Association (NATA) and work in the high school, high school/clinic, and collegiate setting. The survey will be sent by the NATA staff.

- c. *How will you obtain informed consent from each participant or the subject's legally authorized representative and ensure that all consent forms are appropriately documented? Be sure to attach a copy of your consent form to the project summary.*

Informed consent is implied upon completing and returning the survey. Subjects have the right to chose not to participate. This is stated in the cover letter that will be attached to the front (first page) of the survey.

- d. *Show that the research plan makes provisions to monitor the data collected to insure the safety of all subjects. This includes the privacy of subjects' responses and provisions for maintaining the security and confidentiality of the data.*

This is an anonymous questionnaire and upon submission electronically, neither the name of the subject nor email address will be attached to their answers. The information will be kept strictly confidential. The data will be kept in a password protected electronic file on University servers where only the researcher and advisor will have access to this file.

3. *Check the appropriate box(es) that describe the subjects you plan to use.*

<input checked="" type="checkbox"/> <i>Adult volunteers</i>	<input type="checkbox"/> <i>Mentally Disabled People</i>
<input type="checkbox"/> <i>CAL University Students</i>	<input type="checkbox"/> <i>Economically Disadvantaged People</i>
<input type="checkbox"/> <i>Other Students</i>	<input type="checkbox"/> <i>Educationally Disadvantaged People</i>
<input type="checkbox"/> <i>Prisoners</i>	<input type="checkbox"/> <i>Fetuses or fetal material</i>
<input type="checkbox"/> <i>Pregnant Women</i>	<input type="checkbox"/> <i>Children Under 18</i>
<input type="checkbox"/> <i>Physically Handicapped People</i>	<input type="checkbox"/> <i>Neonates</i>

4. *Is remuneration involved in your project?*  *Yes* or  *No*. *If yes, Explain here.*
5. *Is this project part of a grant?*  *Yes* or  *No*. *If yes, provide the following information:*  
*Title of the Grant Proposal* \_\_\_\_\_  
*Name of the Funding Agency* \_\_\_\_\_  
*Dates of the Project Period* \_\_\_\_\_
6. *Does your project involve the debriefing of those who participated?*  *Yes* or  *No*  
*If Yes, explain the debriefing process here.*
7. *If your project involves a questionnaire interview, ensure that it meets the requirements of Appendix \_\_\_ in the Policies and Procedures Manual.*

**California University of Pennsylvania Institutional Review Board**  
**Survey/Interview/Questionnaire Consent Checklist (v021209)**

This form MUST accompany all IRB review requests

Does your research involve ONLY a survey, interview or questionnaire?

- YES**—Complete this form  
 **NO**—You MUST complete the “Informed Consent Checklist”—skip the remainder of this form

Does your survey/interview/questionnaire cover letter or explanatory statement include:

- (1) Statement about the general nature of the survey and how the data will be used?
- (2) Statement as to who the primary researcher is, including name, phone, and email address?
- (3) FOR ALL STUDENTS: Is the faculty advisor’s name and contact information provided?
- (4) Statement that participation is voluntary?
- (5) Statement that participation may be discontinued at any time without penalty and all data discarded?
- (6) Statement that the results are confidential?
- (7) Statement that results are anonymous?
- (8) Statement as to level of risk anticipated or that minimal risk is anticipated? (NOTE: If more than minimal risk is anticipated, a full consent form is required—and the Informed Consent Checklist must be completed)
- (9) Statement that returning the survey is an indication of consent to use the data?
- (10) Who to contact regarding the project and how to contact this person?
- (11) Statement as to where the results will be housed and how maintained? (unless otherwise approved by the IRB, must be a secure location on University premises)
- (12) Is there text equivalent to: “Approved by the California University of Pennsylvania Institutional Review Board. This approval is effective nn/mm/nn and expires mm/mm/mm”? (the actual dates will be specified in the approval notice from the IRB)?
- (13) FOR ELECTRONIC/WEBSITE SURVEYS: Does the text of the cover letter or explanatory statement appear before any data is requested from the participant?
- (14) FOR ELECTONIC/WEBSITE SURVEYS: Can the participant discontinue participation at any point in the process and all data is immediately discarded?

**California University of Pennsylvania Institutional Review Board  
Informed Consent Checklist (v021209)**

This form **MUST** accompany all IRB review requests

Does your research involve **ONLY** a survey, interview, or questionnaire?

**YES**—DO NOT complete this form. You **MUST** complete the “Survey/Interview/Questionnaire Consent Checklist” instead.

**NO**—Complete the remainder of this form.

**1. Introduction** (check each)

- (1.1) Is there a statement that the study involves research?  
 (1.2) Is there an explanation of the purpose of the research?

**2. Is the participant.** (check each)

- (2.1) Given an invitation to participate?  
 (2.2) Told why he/she was selected.  
 (2.3) Told the expected duration of the participation.  
 (2.4) Informed that participation is voluntary?  
 (2.5) Informed that all records are confidential?  
 (2.6) Told that he/she may withdraw from the research at any time without penalty or loss of benefits?  
 (2.7) 18 years of age or older? (if not, see Section #9, Special Considerations below)

**3. Procedures** (check each).

- (3.1) Are the procedures identified and explained?  
 (3.2) Are the procedures that are being investigated clearly identified?  
 (3.3) Are treatment conditions identified?

**4. Risks and discomforts.** (check each)

- (4.1) Are foreseeable risks or discomforts identified?  
 (4.2) Is the likelihood of any risks or discomforts identified?  
 (4.3) Is there a description of the steps that will be taken to minimize any risks or discomforts?  
 (4.4) Is there an acknowledgement of potentially unforeseeable risks?  
 (4.5) Is the participant informed about what treatment or follow up courses of action are available should there be some physical, emotional, or psychological harm?  
 (4.6) Is there a description of the benefits, if any, to the participant or to others that may be reasonably expected from the research and an estimate of the likelihood of these benefits?  
 (4.7) Is there a disclosure of any appropriate alternative procedures or courses of treatment that might be advantageous to the participant?

**5. Records and documentation.** (check each)

- (5.1) Is there a statement describing how records will be kept confidential?  
 (5.2) Is there a statement as to where the records will be kept and that this is a secure location?  
 (5.3) Is there a statement as to who will have access to the records?

**6. For research involving more than minimal risk (check each),**

- (6.1) Is there an explanation and description of any compensation and other medical or counseling treatments that are available if the participants are injured through participation?
- (6.2) Is there a statement where further information can be obtained regarding the treatments?
- (6.3) Is there information regarding who to contact in the event of research-related injury?

**7. Contacts (check each)**

- (7.1) Is the participant given a list of contacts for answers to questions about the research and the participant's rights?
- (7.2) Is the principal researcher identified with name and phone number and email address?
- (7.3) FOR ALL STUDENTS: Is the faculty advisor's name and contact information provided?

**8. General Considerations (check each)**

- (8.1) Is there a statement indicating that the participant is making a decision whether or not to participate, and that his/her signature indicates that he/she has decided to participate having read and discussed the information in the informed consent?
- (8.2) Are all technical terms fully explained to the participant?
- (8.3) Is the informed consent written at a level that the participant can understand?
- (8.4) Is there text equivalent to: "Approved by the California University of Pennsylvania Institutional Review Board. This approval is effective nn/nn/nn and expires mm/mm/mm"? (the actual dates will be specified in the approval notice from the IRB)

**9. Specific Considerations (check as appropriate)**

- (9.1) If the participant is or may become pregnant is there a statement that the particular treatment or procedure may involve risks, foreseeable or currently unforeseeable, to the participant or to the embryo or fetus?
- (9.2) Is there a statement specifying the circumstances in which the participation may be terminated by the investigator without the participant's consent?
- (9.3) Are any costs to the participant clearly spelled out?
- (9.4) If the participant desires to withdraw from the research, are procedures for orderly termination spelled out?
- (9.5) Is there a statement that the Principal Investigator will inform the participant or any significant new findings developed during the research that may affect them and influence their willingness to continue participation?
- (9.6) Is the participant is less than 18 years of age? If so, a parent or guardian must sign the consent form and assent must be obtained from the child
- Is the consent form written in such a manner that it is clear that the parent/guardian is giving permission for their child to participate?
- Is a child assent form being used?
- Does the assent form (if used) clearly indicate that the child can freely refuse to participate or discontinue participation at any time without penalty or coercion?
- (9.7) Are all consent and assent forms written at a level that the intended participant can understand? (generally, 8<sup>th</sup> grade level for adults, age-appropriate for children)



**California University of Pennsylvania Institutional Review Board**  
**Review Request Checklist** (v021209)

This form MUST accompany all IRB review requests.  
 Unless otherwise specified, ALL items must be present in your review request.

Have you:

- (1.0) FOR ALL STUDIES: Completed ALL items on the Review Request Form?  
 Pay particular attention to:
- (1.1) Names and email addresses of all investigators
    - (1.1.1) FOR ALL STUDENTS: use only your CalU email address
    - (1.1.2) FOR ALL STUDENTS: Name and email address of your faculty research advisor
  - (1.2) Project dates (must be in the future—no studies will be approved which have already begun or scheduled to begin before final IRB approval—NO EXCEPTIONS)
  - (1.3) Answered completely and in detail, the questions in items 2a through 2d?
    - 2a: NOTE: No studies can have zero risk, the lowest risk is “minimal risk”. If more than minimal risk is involved you MUST:
      - i. Delineate all anticipated risks in detail;
      - ii. Explain in detail how these risks will be minimized;
      - iii. Detail the procedures for dealing with adverse outcomes due to these risks.
      - iv. Cite peer reviewed references in support of your explanation.
    - 2b. Complete all items.
    - 2c. Describe informed consent procedures in detail.
    - 2d. NOTE: to maintain security and confidentiality of data, all study records must be housed in a secure (locked) location ON UNIVERSITY PREMISES. The actual location (department, office, etc.) must be specified in your explanation and be listed on any consent forms or cover letters.
  - (1.4) Checked all appropriate boxes in Section 3? If participants under the age of 18 years are to be included (regardless of what the study involves) you MUST:
    - (1.4.1) Obtain informed consent from the parent or guardian—consent forms must be written so that it is clear that the parent/guardian is giving permission for their child to participate.
    - (1.4.2) Document how you will obtain assent from the child—This must be done in an age-appropriate manner. Regardless of whether the parent/guardian has given permission, a child is completely free to refuse to participate, so the investigator must document how the child indicated agreement to participate (“assent”).
  - (1.5) Included all grant information in section 5?
  - (1.6) Included ALL signatures?
- (2.0) FOR STUDIES INVOLVING MORE THAN JUST SURVEYS, INTERVIEWS, OR QUESTIONNAIRES:
- (2.1) Attached a copy of all consent form(s)?
  - (2.2) FOR STUDIES INVOLVING INDIVIDUALS LESS THAN 18 YEARS OF AGE: attached a copy of all assent forms (if such a form is used)?
  - (2.3) Completed and attached a copy of the Consent Form Checklist? (as appropriate—see that checklist for instructions)

- (3.0) FOR STUDIES INVOLVING ONLY SURVEYS, INTERVIEWS, OR QUESTIONNAIRES:
- (3.1) Attached a copy of the cover letter/information sheet?
  - (3.2) Completed and attached a copy of the Survey/Interview/Questionnaire Consent Checklist? (see that checklist for instructions)
  - (3.3) Attached a copy of the actual survey, interview, or questionnaire questions in their final form?
- (4.0) FOR ALL STUDENTS: Has your faculty research advisor:
- (4.1) Thoroughly reviewed and approved your study?
  - (4.2) Thoroughly reviewed and approved your IRB paperwork? including:
    - (4.2.1) Review request form,
    - (4.2.2) All consent forms, (if used)
    - (4.2.3) All assent forms (if used)
    - (4.2.4) All Survey/Interview/Questionnaire cover letters (if used)
    - (4.2.5) All checklists
  - (4.3) IMPORTANT NOTE: Your advisor's signature on the review request form indicates that they have thoroughly reviewed your proposal and verified that it meets all IRB and University requirements.
- (5.0) Have you retained a copy of all submitted documentation for your records?

**Project Director's Certification**  
Program Involving HUMAN SUBJECTS

The proposed investigation involves the use of human subjects and I am submitting the complete application form and project description to the Institutional Review Board for Research Involving Human Subjects.

I understand that Institutional Review Board (IRB) approval is required before beginning any research and/or data collection involving human subjects. If the Board grants approval of this application, I agree to:

1. Abide by any conditions or changes in the project required by the Board.
2. Report to the Board any change in the research plan that affects the method of using human subjects before such change is instituted.
3. Report to the Board any problems that arise in connection with the use of human subjects.
4. Seek advice of the Board whenever I believe such advice is necessary or would be helpful.
5. Secure the informed, written consent of all human subjects participating in the project.
6. Cooperate with the Board in its effort to provide a continuing review after investigations have been initiated.

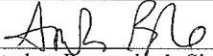
I have reviewed the Federal and State regulations concerning the use of human subjects in research and training programs and the guidelines. I agree to abide by the regulations and guidelines aforementioned and will adhere to policies and procedures described in my application. I understand that changes to the research must be approved by the IRB before they are implemented.

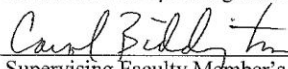
**Professional Research**

\_\_\_\_\_  
Project Director's Signature

\_\_\_\_\_  
Department Chairperson's Signature

**Student or Class Research**

  
\_\_\_\_\_  
Student Researcher's Signature

  
\_\_\_\_\_  
Supervising Faculty Member's  
Signature if required

  
\_\_\_\_\_  
Department Chairperson's Signature

**ACTION OF REVIEW BOARD** (IRB use only)

The Institutional Review Board for Research Involving Human Subjects has reviewed this application to ascertain whether or not the proposed project:

1. provides adequate safeguards of the rights and welfare of human subjects involved in the investigations;
2. uses appropriate methods to obtain informed, written consent;
3. indicates that the potential benefits of the investigation substantially outweigh the risk involved.
4. provides adequate debriefing of human participants.
5. provides adequate follow-up services to participants who may have incurred physical, mental, or emotional harm.

Approved [\_\_\_\_\_]

Disapproved

\_\_\_\_\_  
Chairperson, Institutional Review Board

\_\_\_\_\_  
Date



## California University of Pennsylvania

Dear Fellow Certified Athletic Trainer:

My name is Amber Boyle and I am currently a graduate student at California University of Pennsylvania pursuing a Master of Science in Athletic Training. Part of the graduate study curriculum is to complete a research thesis through conducting research. The primary purpose of this study is to examine how Certified Athletic Trainers use ankle prophylactics in the prevention and treatment of injury.

High school and collegiate Athletic Trainer who are members of the National Athletic Trainers' Association are being asked to submit this questionnaire; however, your participation is voluntary and you do have the right to choose not to participate. You also have the right to discontinue participation at any time during the survey completion process at which time your data will be discarded. The California University of Pennsylvania Institutional Review Board has reviewed and approved this project. This approval is effective nn/nn/nn and expires mm/mm/mm.

All survey responses are anonymous and will be kept confidential, and informed consent to use the data collected will be assumed upon return of the survey. Aggregate survey responses will be housed in a password protected file on the CalU campus. Minimal risk is posed by participating as a subject in this study. I ask that you please take this survey at your earliest convenience as it will take approximately 5- 10 minutes to complete. If you have any questions regarding this project, please feel free to contact the primary researcher, Amber Boyle at boy7061@calu.edu. You can also contact the faculty advisor for this research Carol Biddington, EdD at biddington@calu.edu or 724-938-4356. Thanks in advance for your participation. Please click the following link to access the survey

[\(INSERT LINK HERE\)](#)

Thank you for taking the time to take part in my thesis research. I greatly appreciate your time and effort put into this task.

Sincerely,

Amber Boyle, ATC  
Primary Researcher  
California University of Pennsylvania  
250 University Ave  
California, PA 15419  
574-274-7504  
Boy7061@calu.edu

Certified Athletic Trainers Use of  
Ankle Prophylactic Devices Survey

Demographic Information

1. Age \_\_\_\_\_

2. Years of Experience \_\_\_\_\_

3. Gender:        Male                      Female

4. Highest Level of Education \_\_\_\_\_

5. Work Setting:     High School     High School/Clinic     College

Choose one answer to complete the question.

6. After an acute ankle injury, I would choose an ankle \_\_\_\_\_  
to provide more stabilization.

a) Taping            b) Brace            c) Both at same time

7. Choose the ankle taping that you most commonly use:

- A. To prevent injury
- a) Closed basket weave
  - b) Open basket weave
  - c) Spatting
  - d) Peroneal
  - e) Fibular
  - f) Spartan Slipper (boot)
  - g) Subtalar Sling
  - h) Other \_\_\_\_\_

- B. After injury
- a) Closed basket weave
  - b) Open basket weave
  - c) Spatting
  - d) Peroneal
  - e) Fibular
  - f) Spartan Slipper (boot)
  - g) Subtalar Sling
  - h) Other \_\_\_\_\_

8. Choose the ankle brace that you most commonly use:

- A. To prevent injury
- a) Lace-up
  - b) Semi-rigid
  - c) Air/Gel Bladder

d) Rigid

B. After injury

- a) Lace-up
- b) Semi-rigid
- c) Air/Gel Bladder
- d) Rigid

9. Choose the brand that you most commonly use:

- a) Med Spec (ASO)
- b) Active Ankle Systems, Inc
- c) Swede-O, Inc
- d) DJO (DonJoy, Aircast, Empi, etc)
- e) McDavid
- f) Everlast Ultra
- g) Cramer
- h) Pro-Tech Athletics
- i) Össur Americas (Gameday, Exoform, etc)
- j) Other \_\_\_\_\_

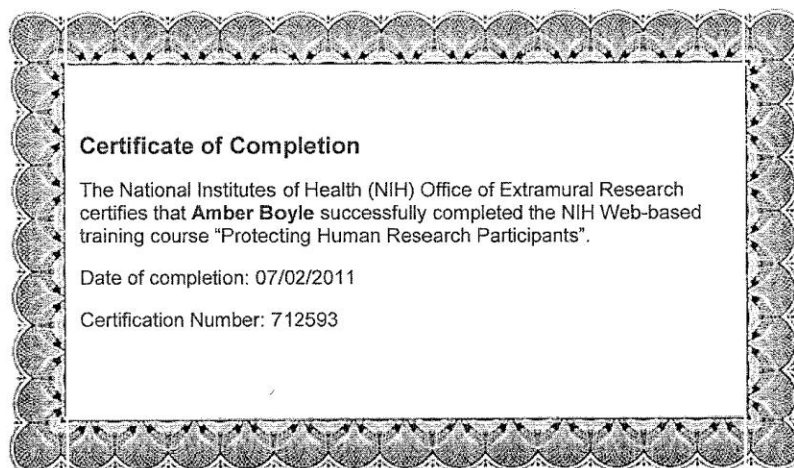
Choose yes or no.

10. When taping an ankle, do you use the following:

- |                                |     |    |
|--------------------------------|-----|----|
| a) Athletic white tape         | yes | no |
| b) Heavy-weight/Elastikon tape | yes | no |
| c) Light weight stretchy tape  | yes | no |
| d) Mole Skin                   | yes | no |
| e) Leukotape                   | yes | no |
| f) Pre-wrap                    | yes | no |
| g) Other _____                 | yes | no |

11. Did you choose your preference of taping, bracing, or both at the same time because:

- |  |     |    |
|--|-----|----|
| a) of your knowledge of the literature?  | yes | no |
| b) of budgetary limits?  | yes | no |
| c) of athlete preference?  | yes | no |
| d) of personal opinion/experience?   | yes | no |
| e) it provides more stability than the other choices?                                | yes | no |
| a) it prevents injury or re-injury better than the other choices?                    | yes | no |
| b) it is easier to apply or doesn't take as much time to apply as the other choices? | yes | no |
| c) that is how you were taught and/or how all your peer AT's do it?                  | yes | no |



**Institutional Review Board  
California University of Pennsylvania  
Morgan Hall, Room 310  
250 University Avenue  
California, PA 15419  
[instreviewboard@calu.edu](mailto:instreviewboard@calu.edu)  
Robert Skwarecki, Ph.D., CCC-SLP, Chair**

**Dear Amber Boyle:**

**Please consider this email as official notification that your proposal titled "Athletic Trainers Use of Prophylactic Devices in the Ankle" (Proposal #11-016) has been approved by the California University of Pennsylvania Institutional Review Board as submitted.**

**The effective date of the approval is 12-06-2011 and the expiration date is 12-05-2012. These dates must appear on the consent form .**

**Please note that Federal Policy requires that you notify the IRB promptly regarding any of the following:**

- (1) Any additions or changes in procedures you might wish for your study (additions or changes must be approved by the IRB before they are implemented)**
- (2) Any events that affect the safety or well-being of subjects**
- (3) Any modifications of your study or other responses that are necessitated by any events reported in (2).**
- (4) To continue your research beyond the approval expiration date of 12-05-2012 you must file additional information to be considered for continuing review.**

**Please contact [instreviewboard@calu.edu](mailto:instreviewboard@calu.edu)**

**Please notify the Board when data collection is complete.**

**Regards,  
Robert Skwarecki, Ph.D., CCC-SLP  
Chair, Institutional Review Board**



Appendix C4  
Cover Letter



## California University of Pennsylvania

Dear Fellow Certified Athletic Trainer:

My name is Amber Boyle and I am currently a graduate student at California University of Pennsylvania pursuing a Master of Science in Athletic Training. Part of the graduate study curriculum is to complete a research thesis through conducting research. The primary purpose of this study is to examine how Certified Athletic Trainers use ankle prophylactics in the prevention and treatment of injury.

High school and collegiate Athletic Trainers who are members of the National Athletic Trainers' Association are being asked to submit this questionnaire; however, your participation is voluntary and you do have the right to choose not to participate. You also have the right to discontinue participation at any time during the survey completion process at which time your data will be discarded. The California University of Pennsylvania Institutional Review Board has reviewed and approved this project. This approval is effective 12/06/11 and expires 12/05/12.

All survey responses are anonymous and will be kept confidential, and informed consent to use the data collected will be assumed upon return of the survey. Aggregate survey responses will be housed in a password protected file on the CalU campus. Minimal risk is posed by participating as a subject in this study. I ask that you please take this survey at your earliest convenience as it will take approximately 5- 10 minutes to complete. If you have any questions regarding this project, please feel free to contact the primary researcher, Amber Boyle at [boy7061@calu.edu](mailto:boy7061@calu.edu). You can also contact the faculty advisor for this research Carol Biddington, EdD at [biddington@calu.edu](mailto:biddington@calu.edu) or 724-938-4356. Thanks in advance for your participation. Please click the following link to access the survey

<https://www.surveymonkey.com/s/ATCankleprophylacticdevicesurvey>

Thank you for taking the time to take part in my thesis research. I greatly appreciate your time and effort put into this task.

Sincerely,

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## ABSTRACT

**TITLE:** ATHLETIC TRAINERS USE OF PROPHYLACTIC DEVICES IN THE ANKLE

**RESEARCHER:** Amber Boyle, ATC, PES

**ADVISOR:** Dr. Carol Biddington

**DATE:** April 2012

**PURPOSE:** The primary purpose of this study was to examine athletic trainers use of prophylactic devices in the ankle.

**Design:** Descriptive Survey

**Settings:** Population-Based Survey

**Participants:** There were 196 randomly selected ATCs currently working in the collegiate, high school, or high school/clinic setting as participants.

**INTERVENTIONS:** The dependent variables were taping or bracing and preventing or post-injury prophylactic use. The independent variable was employment setting of athletic trainers and included high school, high school/clinic, and college.

**RESULTS:** Statistical significance was found in two of the three hypotheses which indicate that athletic trainers from the collegiate setting choose to apply both bracing and taping after an acute ankle injury. In addition, a closed basket weave taping technique is the preferred ankle taping for collegiate athletic trainers to prevent injury.

**CONCLUSIONS:** Based on the results of this study, we can conclude that collegiate athletic trainers have a similar preference of prophylactic device to prevent and treat ankle injuries.