Perceptions of Certified Athletic Trainers regarding Methicillin-Resistant Staphylococcus Aureus Prevention Strategies

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ABSTRACT

Methicillin Resistant Staphylococcus Aureus (MRSA) has been receiving significant attention, highlighting an increased risk of infectious transmission associated with athletic participation. As MRSA infections are becoming increasing virulent, athletic trainers are presented with immediate prevention challenges. While recommendations have been offered by the Centers for Disease Control and Prevention outlining basic prevention procedures, adherence to proposed guidelines and actual perception of the threat still pose the greatest hurdles to eradication of MRSA. Success in control and prevention of transmission of MRSA in athletic environments can be furthered by first investigating the perceptions of the problem in one of the first line of defense for athletes—their athletic trainers. Of particular importance are the perceptions of trainers' adherence to guidelines, perceptions of protocol standards, and relative threat of MRSA in the athletic environment. This study attempts to determine these perceptions and predict how athletic trainers will receive and adhere to standardized guidelines through written policy for MRSA prevention. Results reflect an increase in the awareness of MRSA as a threat to athletics since 2004. Overall positive perception of the development of guidelines and protocols specifically targeted to prevention of MRSA transmission in the athletic environment were also defined through this study. Athletic trainers surveyed expressed strong desire for additional training in procedures specific to reducing transmission of MRSA to prevent outbreaks.

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Chapter 1

Introduction

Methicillin-resistant Staphylococcus Aureus (MRSA) is an infection caused by a strain of Staphylococcus Aureus bacteria that is highly resistant to antibiotics. The bacteria can cause infection –often when it enters the body through a cut, sore, catheter, breathing tube, or other opening through broken skin- that do not respond to antibiotics used to treat staph infections(Advic E, 2008). It was first recognized in healthcare settings in the 1970's as an epidemic leading to endemnicity (Hilts, 2006). Historically, infections due to MRSA have been isolated to the healthcare setting with populations defined by clear characteristics which define the exposures within specific healthcare settings. Though historically infections due to MRSA have been isolated to healthcare settings with populations defined with clear characteristics and exposures, in the past 5 years there have been increasing reports of MRSA outbreaks in individuals which lack these well-defined characteristics of those associated previously with HA-MRSA (Abrahamian R, 2007). These new outbreaks without healthcare associated risk factors are currently defined as community acquired (CA-MRSA) and include individuals who are otherwise healthy and lack the risk exposure from traditional settings. These situations offer significantly higher risk of transmission and the rate of mortality and dangerous virulence increases with transmission CA-MRSA.

The recognition of a more aggressive and complex lineage of MRSA infections introduced to the population through common contact has made the process of identifying the origin and effectively treating these infections more complex (Boucher H, 2008). A recent study

which identified significantly higher healthcare costs associated with MRSA infections points to the increasing burden on resources as community acquired MRSA cases continue to rise (Lodise T, 2005). The economic impact, as well as increasing morbidity associated with the recognition of more virulent strains along the CA-MRSA lineage, present an emerging threat to the population at large (Chi C, 2004; Tacconelli, 2008). Although MRSA has an endemic quality due to the longevity of its presence on various surfaces, the control of potential risk factors within communities that have been highlighted for their unique susceptibility is becoming increasingly important.

MRSA infections continue to present a significant threat to athletic departments. The presence of Athletic trainers offers a direct patient education opportunity as well as environmental control through exercise of prevention strategies. Strategies for MRSA prevention have been presented by the CDC, in addition, the NATA has also created a position statement concerning recommended prevention techniques (Beam J, 2006). Even with recommendations for control of the spread of MRSA it has become increasingly apparent, through the continued reports of outbreaks, that compliance with these practices is not optimal. More evidence-based guidelines are needed to decrease the general endemic potential of MRSA in athletic settings. Further, studies have shown that compliance with basic prevention strategies decreases incidence of MRSA transmission in populations of high risk (Coia, et al, 2006). MRSA continues to gain strength, and this requires consistent prevention efforts with a focused direction toward the elevation of general awareness and patient education on controlling risk factors. Studies have shown that compliance with basic prevention strategies decreases incidence of MRSA transmission in populations of high risk (Coia J, 2006). An important factor

to consider is the importance of preventing initial transmission rather than a more reactive approach to treating infections after they have been identified.

In 2006 less than half of certified Athletic Trainers surveyed by the NATA were aware of NATA position statement on MRSA prevention (Goding A, 2007). This statistic is of particular importance when it is considered that Athletic Trainers are the first line of defense for patient education and medical facility control in the athletic environment. As defined by several literature reviews evaluating cost analysis and hospital stay requirements of MRSA compared with a similar infection known as Methicillin Susceptible staphylococcus Aureus, outbreaks can be costly and destructive (Abrahamian R, 2007; Chi C, 2004; Lodise T, 2005). The costs incurred include medications, hospital fees, physician fees, consultations and follow-ups. Success of athletic programs is built on the performance of each team. The time loss that occurs from serious injury and illness can have a significantly negative effect on the success of an athletic program, especially with the potential for hospitalization that can be linked to complications from MRSA related conditions. The morbidity of these infections, even less virulent strains can affect the health and well-being of the athletes, time lost from practices and games as well as revenue for the athletic department.

A major component of MRSA prevention are those steps, personally, that can be taken to decrease general risk in environments of close person to person contact. Messages of prevention are paramount but are often times overlooked in the comprehensive approach (Coia J, 2006). These issues arise throughout the discussion of MRSA prevention and must be addressed in order to properly develop a plan for prevention of epidemic MRSA outbreaks. However, even with comprehensive outlined guidelines, the fundamental success of such programs will only be as effective as the individuals who follow the guidelines with authenticity (D. M. Cabana M,

2002; Henderson, 2006). Common hygienic procedures should be regularly addressed in close communities such as in athletics. These practices are often taken without serious consideration, however the most common procedures from not sharing towels, razors, shower supplies and personal care items to maintaining a clean environment must be addressed as part of a complete patient education program(Humphreys H, 2009; Kowalski TJ, 2005). Common practices will decrease transmission across the board. Therefore, evaluation of perceptions of Athletic Trainers awareness of the potential problems that can arise from MRSA outbreaks is necessary to develop a plan to standardize practices of prevention including patient education in such a way that influence will be widespread to ensure appropriate actions are taken by professionals on all levels.

Statement of Problem

The purpose of this study is to determine the perception of certified Athletic Trainers to MRSA prevention strategies among certified Athletic Trainers in accordance with recommendations put forth by both the CDC and National Athletic Trainer's Association. The perception of Athletic Trainers in respect to the prevalence and threat of CA-MRSA must be addressed in order to accurately assess potential barriers to adherence that can be taken into consideration for policy development. A standardized prevention policy which would facilitate procedures consistent throughout the athletic population on the college/university level can only be developed through careful consideration of current procedures and their respective effectiveness. Athletic Trainers have a key role in the implementation of MRSA prevention strategies and the perception of this responsibility is fundamental to the success or failure of prevention policy development. The development of consistent prevention efforts is a direct

reflection of the general awareness and perceived threat of infection control guidelines in daily operation of Sports Medicine programs.

Research Questions

1. Has the perception of MRSA, as a threat to athletic departments, changed since 2004?
2. What is the level of adherence of ATC's to consistent MRSA prevention strategies with respect to continued education of medical providers and patient education?
3. What do ATC's perceive as their responsibility for the adherence to prevention policy development?

Significance

This study proposes to determine the perception of certified Athletic Trainers concerning the current MRSA threat within athletic environments. Since 2006 the potential for a general increase or decrease in awareness can be used to consider the impact on prevention efforts and adherence to prevention policy development. For any deficits in self-reported adherence that may exist from certified Athletic Trainers on various levels within the college/university setting, barriers to action as well as cue to actions can be determined in an effort to develop stronger reactions and more accurate perceptions throughout the athletic community. Any discrepancies in awareness or in adherence between divisions of athletic participation throughout the National Collegiate Athletic Association (NCAA) can be identified through careful analysis and used to provide thorough policy development in user-friendly and accessible manner to raise adherence levels across the board. It is important to consider the discrepancy between program developments and analyze the successes and perceptions of programs incorporating both

environmental transmission of MRSA as well as focused patient education for prevention. In addition various discrepancies can also be identified between groups including, but not limited to: Divisions (I, II, III), years of experience as an ATC, previous experience with MRSA, geographic location. Identification of specific groups' perceptions of MRSA can impact how policy development will be accepted and may offer insight into methods that would make standard procedures more successful.

Chapter 2

Literature Review

Introduction

Medical documentation has consistently provided justification and supported the value of prevention within the areas of disease and infection transmission. Literature reviews consistently outline the necessity of standard operating procedures as well as the positive benefits of raising awareness in effort to initiate health behavior change (Appelbaum, 2006; Cauda R, 2009; Coia J, 2006; Prevention, 2003). This study is designed with a framework utilizing the Health Belief Model (HBM) as a theoretical basis for designing behavior change within the medical community, specifically evaluating perceptions of Athletic Trainers. The intention is to evaluate the current support within medical literature for establishing a relationship between clinician perception, patient education and infection control through prevention. By using the HBM the benefits, drawbacks and potential cues can be identified and directly applied to the development of successful prevention and recognition policies.

Myths surrounding MRSA are prevalent with the increase in media coverage of recent severe cases of MRSA leading to death. In October of 2007, several school systems were highlighted due to the recognition of MRSA in several high school deaths. MSNBC reported a school system in Eastern Kentucky that chose to shut down 23 schools for disinfection as a preventative measure following a confirmed case of MRSA from a student in the system (Abrahamian R, 2007). Another report by the Associated Press reported the death of a Virginia High School senior linked to MRSA which resulted in a widespread response by schools

nationwide to shut down for disinfection. Furthermore, there have been multiple reports through public media discussing the prevalence and potential risks involved with MRSA from 'protecting yourself against a potentially deadly superbug' to 'superbug kills young and healthy' (AP & Reuters, 2007, 2008). These headlines grab the attention of the general public and have lead to a level of awareness about MRSA which can be attributed to the development of common myths as well. A concern that is identified through this coverage is the potential for misinformation or misunderstanding that can interfere with positive prevention efforts and cause more inaccurate information to be passed throughout communities.

Some areas of common misperception include, but are not limited to: (1) the meaning of MRSA; (2) MRSA as a new type of infection; (3) signs and symptoms recognized in early stages; (4) the morbidity of MRSA; (5) recommended treatment protocols. In an attempt to dispel widespread misunderstanding of the infection, leading to inappropriate preventative measures and inaccurate perceptions of the problem itself in these areas, the CDC has released several reports (CDC, 2008). From these reports, it is clear that MRSA infections currently present a significant risk for potential outbreaks. The need for continued research in prevention strategy is clear. The current body of literature, regarding effectiveness of prevention strategies for community acquired MRSA infections, is limited. Misinformation not only has the potential to negatively impact consistent efforts for prevention by can significantly damage sound treatment procedures. Another potential barrier to slow the process of controlling outbreaks of this dangerous infection is directly related to the misunderstanding of accurate information distribution. The negative and panic driven reactions to MRSA have created environments that are focused on limited control of the environment without addressing the education of the community for prevention of further outbreaks.

MRSA infections currently present a significant risk for potential outbreaks which can be costly and devastating to individual athletes, teams as well as communities. The need for continued research in prevention strategy is clear. Currently the data on effectiveness of prevention strategies for community acquired MRSA infections is limited. As outlined, the most common barrier to successful prevention policy development is compliance with prevention guidelines. These guidelines are most effective when they incorporate patient education, clinician education, environmental decontamination and sound hygienic education for communities of people living in close quarters (Advic E, 2008; Beam J, 2006; Benjamin H, 2007; Garau J, 2009). The lack of incorporation of even one area of prevention can lead to increased risk of outbreaks with devastating impact on communities, athletic teams, etc.

Theoretical Model

The Health Belief Model (HBM) is based a theory that behavior depends not only on an individual's perception of that environment but also on the influence of the environment (Painter J, 2008). Personal perceptions such as perceived threat and benefits and barriers to practice, when combined with self-efficacy and cues to action, influence likelihood of adopting a behavior. This model aligns with the prevention strategy to determine effectiveness of program prevention through policy development. The HBM provides a model for facilitating the development as well as evaluation of prevention efforts to control the spread of MRSA as well as other disease transmissions. This model has been previously used to evaluate perceptions as well as preferred educational opportunities when evaluating infection control policies (Brinsley K, 2005). The psychological aspect of the HBM that attempts to predict behaviors focuses on the attitudes and beliefs of individuals in an attempt to explain reasons for action or barriers to action. This model can be applied to a broad range of health behaviors and populations because

of its conceptual setup based on constructs. These constructs are the core beliefs that build the framework for theoretical development.

The original HBM was based on 4 constructs of individual perceptions (Rosenstock, 1974). The constructs of the theoretical model are the core beliefs that are building blocks that tie together the more complex ideas of a theory to be build upon. These 4 constructs are: perceived susceptibility, perceived severity, perceived barriers, and perceived benefits. This theoretical framework provides a baseline understanding of expected results in the consideration of compliance and adherence to prevention policies. Taking the four core beliefs into consideration the model aligns itself with the ultimate goals of determining the success or barriers to success of infection control specifically dealing with antimicrobial resistance. The perceived susceptibility of a clinician considers the impact of the infection transmission on a personal level through the use, or lack of compliance to, prevention guidelines. Perceived severity has a direct influence on the level and longevity of a clinician's adherence to a compliance protocol. For example, if there is the perception that the threat is low and the consequences of the threat are not severe, this can naturally lead to a lack of compliance with recommended procedures in both clinician and patient alike Perceived barriers to prevention policy adherence can range from lack of awareness and lack of resources to simply a lack of motivation to alter practice standards (D. M. Cabana M, 2002). An addition made to the basic 4 constructs includes cues to action which allows the evaluation to be used to draw inferences for potential changes for positive results in future prevention policies(Glanz K, 2002). A final construct in the HBM is self-efficacy which determines the confidence each individual has in their own ability to take action(Glanz K, 2002). Self efficacy can be influenced and supported through providing reassurance, proper training and guidance. Combined the 6 constructs outlined in the HBM set up a clear structure to base the

potential success of behavior change on a large scale in direct relation to the behavior change necessary to successfully influence infection control policy development.

Policy development offers a clear set of guidelines to follow leaving little room for doubt in successful adoption of new behaviors targeted at preventing serious infections from being transmitted in athletic environments. The primary goal of this evaluation process within the HBM framework is to develop a clearer picture of the general awareness of clinicians to practice guidelines developed for prevention of MRSA transmission and to predict behavioral responses to various approaches to prevention policy adoption by the majority of subjects surveyed.

Focusing on the potential barriers to action allows policy development to follow a route that allows adoption of behaviors to be more specifically targeted. These barriers the influence of previous practices/behaviors and external influences can also directly affect the adoption and long term adherence rate of behavior change for medical professionals (Cabana M, 1998). Using multiple interventions that take into consideration the potential barriers, focuses on the benefits of behavior change, and considers the most influential cues to action, combines the most likely successful plan for behavior adoption by the target population.

Infection Control Education

Disease prevention education is the foundation of all programs directed at limiting the spread of illnesses and infections. In order to determine the need for prevention efforts, and to decide upon the most appropriate method of prevention, a clear scope of the problem must be developed and the potential barriers to action by the appropriate involved individuals assessed. In a study by (Giblin T, 2004) presented an example of a needs-assessment showing the importance to the medical community for determining the perception of a potential hazard

involving antimicrobial resistance. This study was instrumental in determining the perception of the severity of antimicrobial resistance by clinicians in healthcare as well as the most preferred methods of receiving instructional information about the subject (Giblin T, 2004). Giblin's work also concentrated on the importance of educating the appropriate audience to raise awareness of the significance of a health care issue in order to motivate efforts to put prevention efforts into action. Larson and Quiros (Harris A, 2000) also found similar results noting the importance of awareness prior to behavior change to raise the likelihood of adherence and/or compliance. The obligation of determining the relevance of health-related issues is essential to positive effects on behaviors related to disease prevention, in general. (Q. D. Larson E, Giblin T, Lin S, 2007). Larson and Quiros raises the question of effectiveness in using evidence-based practices to affect behavior change by assessing attitudes and perceptions of health care workers in a cross sectional study of various settings (Q. D. Larson E, Giblin T, Lin S, 2007). Larson, in 1995, came to similar conclusions attempting to assess compliance and barriers to precautions while evaluating hand washing practices of healthcare workers (K. E. Larson E, 1995). He included the self-reported effectiveness of organizational policies to further assess potential barriers to precautions. Larson demonstrated that, in order to effectively change perceptions in a positive way to affect behavior, awareness of a problem must be followed by the development of an organized policy-structure (Larson, 2003). These studies outline the importance of background needs assessment and the effect attitudes and perceptions have on the outcomes of behavior change efforts. Even actions as simple as routine hand washing can be perceived in different ways by healthcare workers with the same knowledge base (Farrington, 2007). When considering the significance of how far these practices can reach, the potential for MRSA strains to strengthen and increase the potential damage is profound. This impacts MRSA prevention

directly when considering how basic procedures are that can influence primary prevention. Hand washing offers an example of how basic behaviors must be included in policy and be included in training procedures with repeated instruction in order to effectively influence the long term adherence of those behaviors(Elston D, 2008). Hand washing remains the most important facet of infection control and must be addressed as part of a policy in order to cause positive changes in policy adherence for infection control.

Even actions as simple as routine hand washing can be perceived in different ways by healthcare workers with the same knowledge base. Harris et al, in 2000, completed a survey of hand washing practices and opinions of healthcare workers to gain information on compliance and attitudes toward interventions. Their aim was to increase compliance and ultimately decreasing disease transmission. This study determined that even though workers surveyed had a strong awareness of the importance of hand washing, with observational evaluation, they overestimated their own compliance (Harris, et al, 2000). These professionals, involved daily with the care and prevention of disease, still had a need for intervention to raise their compliance with a fundamental aspect of disease transmission. Studies evaluating the impact of intervention efforts have repeatedly shown the necessity of consistent efforts of healthcare in general to continue to re-evaluate policies and organizational structures to ensure compliance prevent decreased awareness of disease prevention standards (Larson, 2003; K. E. Larson E, 1995; Tubeville S, 2006). These examples serve to explain the need for evaluation of established routines on a continual basis in order to support the efforts of disease prevention.

To further explain the necessary procedures for assessing and reassessing disease prevention strategies Cabana et al (2002) evaluated barriers to clinical practice guidelines. They identified 7 barriers through a literature review of 76 previous studies. This singular study has

set a framework for similar analyses of healthcare workers perceptions in a wide range of settings (Giblin T, 2004; K. E. Larson E, 1995; Q. D. Larson E, Giblin T, Lin S, 2007). The barriers to guidelines involved key areas including general knowledge, attitudes, outcome expectancy and behavioral identifying the following: lack of awareness, lack of agreement, lack of self-efficacy, lack of outcome expectancy and lack of cuing mechanism(Cabana M, 1998; Farrington M, 2000). These barriers identify clear barriers that are addressed through the HBM framework for behavior change. Identifying the areas that present potential obstacles to adherence to guidelines designed to protect both healthcare workers and patients from potentially dangerous infections will allow these areas to be addressed in the creation of successful policies. Two studies completed in 2005 and 2007 respectively cited Cabana's work in their framework for evaluating infection control and perceptions of healthcare workers (Farrington, 2007; Pessoa, 2005). Farrington noted, that in order to effectively mandate the reception of information in lieu of voluntary acceptance, it is imperative that of educational efforts be repeated and incorporated into a structured approach (Farrington, 2007). Raising awareness of health related issues is a fundamental aspect of positive behavior change in the medical community. Raising awareness through continued education on multiple occasions in order to enhance policy adherence can be included as cues to action for behavior change (Wolf R, 2008). Furthermore, raising awareness of the threat of specific conditions can present to medical facilities offers an opportunity to improve the sense of responsibility each medical professional recognizes. As evidence-based research continues to be carried out, positive lessons about practice standards can be taken from the results and can aid in the development of clear strategies and effective interventions. Recognizing these perceptions can improve adherence and advance the methods utilized in policy development to ensure long term adoption of standard procedures for infection control.

MRSA

Infection control continues to be addressed due to increasing rates of antimicrobial resistant disease transmission. At the forefront of discussion is the complications related to a specific nonsocomial infection with a high rate of morbidity and potential for devastating outbreaks. MRSA has created a significant media response in recent months and years with the severity that outbreaks can unfortunately be associated with(Paez A, 2008). With the severity of outbreaks, MRSA has created a significant media response in recent months and years. The risk factors, prevalence and modes of transmission make it an infection that requires consistent prevention and management to control (Advic E, 2008; Cosgrove S, 2006). MRSA infections are grouped into two types: Healthcare-associated MRSA (HA-MRSA) infections occur in people who are or have recently been in the hospital. Community-associated MRSA (CA-MRSA) infections are ones that occur in otherwise healthy people who have not recently been in the hospital (Naimi T, 2003). The number of CA-MRSA cases is increasing and the difficulty in determining the origin of CA-MRSA complicates the use of vaccinations or other treatments for the eradication of the problem (Naimi T, 2008). The difficulty stems from the unusual presentation in people who do not present with well defined risk factors. These cases have led to questions of the potential for increasing resistance of CA-MRSA strains (Herman R, 2008).). Research originating in Geneva Switzerland between 1993 to 2005 highlighted the increasing incidence of PVL-producing lineages of MRSA, which are more significantly suited for community transmission attributed to their virulent and aggressive frequency (Francois P, 2008). Of concern are the recent reports of severe cases of necrotizing pneumonia and sepsis caused by CA-MRSA strains carrying PVL genes. This trend of increasing resistance to β-lactams is not isolated to staphylococci but also to other gram positive and gram negative pathogens

(Appelbaum, 2006). When this is considered on a larger scale, the implications to the direct treatment and management of MRSA on the community level becomes a concern requiring immediate evaluation of standardized procedures for prevention.

In the United States, there have been increasing numbers of reports of outbreaks, even among healthy populations, of MRSA colonization and infection through skin contact in locker rooms and gymnasiums (Paez A, 2008). A study published in the New England Journal of Medicine linked MRSA to the abrasions caused by artificial turf (Moran G, 2006). Three studies by the Texas State Department of Health found that the infection rate among football players was 16 times higher than the national incidence of infection (Barr B, 2006). As infections due to CA-MRSA continue to grow in number and complexity, attempting to stay at the forefront of treatment and prevention in patient care, suffers (Boucher H, 2008).

In 2006 Cosgrove et al provided a cost and hospital stay analysis comparison between MRSA and MSSA infections. In it he found that MRSA lengthened both cost and hospital stay in compared to stays due to MSSA infections. The median hospital charge after bacteremia was significantly higher for patients with MRSA bacteremia ($26,424) than for patients with MSSA bacteremia ($19,212)--as was the median hospital cost ($14,655 vs. $10,655) (Cosgrove S, 2006). A 2007 report in Emerging Infectious Diseases, a publication of the Centers for Disease Control and Prevention (CDC), estimated that the number of MRSA infections treated in hospitals doubled nationwide, from approximately 127,000 in 1999 to 278,000 in 2005, while at the same time deaths increased from 11,000 to more than 17,000 (Klein E, 2007). Another study led by the CDC and published in the October 17, 2007 issue of the Journal of the American Medical Association estimated that MRSA would have been responsible for 94,360 serious infections and associated with 18,650 hospital stay-related deaths in the United States in 2005

(Klevins R, 2007). These tangible statistics provide evidence of the significant threat that MRSA infections present to the community--specifically to groups who are at a higher risk of transmission. Efforts to raise awareness have been relatively successful within the medical community; however, decreasing the spread of these infections relies on the efforts of clinical professionals who have the means to reduce risk of contact through tasks as simple as routine hand washing.

MRSA Prevention

The spread of MRSA from healthcare worker-to-healthcare worker, patient-to-patient and healthcare worker-to-patient is a risk that can be controlled through concerted efforts to follow routine decontamination. These means of transmission can be substantially underestimated by the community of professionals who are at the forefront of MRSA management in everyday contact (Henderson, 2006). Even when the general awareness of MRSA risk factors and effects are at an acceptable level, the compliance with prevention strategies is not always at the same level. In 2007, to determine the relationship between awareness of MRSA management strategies and compliance with prevention efforts, Easton et al evaluated the knowledge of healthcare staff in an acute hospital setting. They concluded that even when there is reasonable acceptance of threat, the cues to action still remain questionable due to the lack of compliance with even basic procedures. In this study, gaps in awareness were highlighted and information and educational needs identified (Easton P, 2007). The needs of medical staff to maintain awareness is crucial to controlling the potential for a MRSA epidemic. The perceptions of medical professionals of the seriousness of consequences from MRSA transmission is a key factor in developing successful strategies for prevention. The American Journal of Infection Control published an observational study which showed evidence that primary transmission of

MRSA occurred through lack of compliance of basic prevention through hand washing (Afif W, 2002). These professionals were aware of the necessity of such basic methods of infection control but seemed to lack the compliance necessary to reduce primary transmission risk. The question that arises from such studies is, what are the best methods are for increasing compliance of healthcare workers to raise awareness and levels of compliance with recommended methods of prevention? The use of formal policy and organized repetition has been shown to be the most effective method for altering perceptions and increasing compliance (Popovich K, 2008).

MRSA in Athletics

Because of the risk of frequent skin contact during competition, close proximity of locker rooms, and risk of contact with contaminated objects and playing surfaces, MRSA presents an increased risk in athletics. Likewise, the nature of athletics taking place in such close-quarters, with frequent contact, increases the risk of transmission—ultimately leading to higher colonization and infection (Popovich K, 2008). A final predisposition in sport is the high rate of skin and soft tissue infections (SSTI's) which allows a easy mode of transmission during activity, unique to athletics (Marcotte, 2008; Sedgwick P, 2007). All these risk factors together, put athletic trainers in a unique position whereby they may influence the health and wellbeing of athletes (Courtney, 1994). With their sphere of influence on both athletes and coaches, athletic trainers can, more easily, relay information with lasting effects on the daily practices of the community as well. In 1994 an article was published in the Journal of Athletic Training, which reminded those in the profession of their unique, positive influence which is fostered through preventative patient education opportunities(Courtney, 1994). This topic is particularly relevant in when considering the prevalence of CA-MRSA in athletics. In 2006 Beam and Buckley published a review of literature, which highlighted the distinct need for the determination of

prevalence and risk factors. To standardize the definition of these factors would make education of prevention strategies more accommodating(Beam J, 2006). Another predisposition that athletics offers is the high rate of skin and soft tissue infections (SSTI's) which allows a mode of transmission during activity unique to athletics as well (Sedgwick P, 2007; Stevens M, 2008). Guidelines are needed that will standardize and facilitate a decrease in risk from a preventative perspective rather than from a treatment standard. Further, the risk of outbreaks caused by CA-MRSA continues to arise when athletes compete at sites which allow their lack of prevention education to influence the risk of opponents at each competition

The risk of transmission continues to present a threat as long as there remains the reality that defined guidelines for prevention remain recommended strategies rather than standards of care. There is a need for guidelines that will standardize and facilitate a decrease in risk from a preventative perspective rather than from a treatment standard. The risk of outbreaks caused by CA-MRSA continues to arise when athletes participate in competition at multiple sites allowing the lack of prevention education to influence the risk of opponents at each competition (Rihn J, 2005). As athletes compete throughout their seasons they are often confronted with soft tissue injuries and frequent skin breaks from contact with other players and playing surfaces. These situations often times are not addressed until officials are made aware of potential hazard due to blood soaked uniforms. Because of this delayed time to address the situation, there are many opportunities for MRSA infections to be introduced to a player's system before being properly cleansed and covered. When athletes are made aware of this potential for serious infection to be introduced the likelihood of reporting may allow for an overall decrease in the transmission of MRSA infections. This must be included as part of a complete prevention plan in order for long term behavior change to support the efforts of control.

The risks of transmission at both home and away contests occur on multiple levels as well. Contact with MRSA is not limited to person to person contact alone. Environmental contamination has yet to be clearly defined (Cimolai, 2008). The transmission of MRSA through the environment is highlighted in athletic participation due to the rate of SSTI through skin breaks from turf burn, body shaving and lack of proper hygiene particularly in wound care (Begler E, 2004). This risk has a particularly significant need for patient education which puts Athletic Trainers in the position for considerable influence in risk reduction. As the primary caregiver in minor SSTI care recognition, treatment, referral, environmental decontamination and patient education should be of major concern to Athletic Trainers(Stryjewski ME, 2008). The risk of transmission through contact with infected opponents, playing surfaces and contact with infected caregivers can each be addressed by Athletic Trainers through careful consideration of CA-MRSA prevention recommendations offered by the CDC and NATA (Romano R, 2006). Minimizing risk can be accomplished through compliance with recommended procedures and should be supported through daily interaction with individuals at risk. Just as similar allied health professions have identified the influence of perception to compliance with standards of care, it is important to identify barriers to compliance with recommended procedures among the Athletic Training Profession.

Throughout athletics, CA-MRSA infections are emerging as a challenging and potentially devastating problem facing athletic trainers (Benjamin H, 2007). All of those involved in the care of athletes should including but not limited to Athletic Trainers, Team Physicians, Coaches, athletes and family members of athletes should be aware of the potential for CA-MRSA infection among athletes. These individuals should also be able to recognize skin lesions that have a potential to be CA-MRSA infections. Sports Medicine professionals should understand the

importance of culturing the infectious lesions in making an accurate diagnosis and guiding antibiotic treatment (Rihn J, 2005). Athletic Trainers must be meticulous in fully covering all infectious lesions with a clean, dry dressing until the lesion is healed and following guidelines for return to play outlined by the CDC (Begler E, 2004). Patient education should be appropriately targeted towards athletic populations and encourage athletes to protect areas of the body that are most susceptible to skin injury and to fully cover areas of skin injury with a clean, dry dressing (Cohen, 1005). Athletic Trainers and coaches must put forth consistent efforts to educate athletes on CA-MRSA infection and good hygiene practices. These recommendations are significantly outlined repeatedly throughout literature to be the most consistent and reliable methods for controlling potentially devastating outbreaks of CA-MRSA in university athletic programs (Beam J, 2006; Cauda R, 2009; Garau J, 2009; Rihn J, 2005).

Despite recent increases in awareness of these standards throughout medical literature as well as public media, many Athletic Trainers are still unfamiliar with such standard prevention measures (Sedgwick P, 2007). There is clear potential for CA-MRSA to cause outbreaks of soft tissue infections with a significant morbidity throughout athletic teams, especially on the collegiate level with close living quarters and frequent contact (A, 2008; Benjamin H, 2007; Nguyen DM, 2005). These outbreaks are complex to treat and difficult to eradicate without proper treatment standards. Preventative guidelines should be emphasized and utilized by Athletic Trainers, coaches, parents and players themselves. These measures should also be consistently supported and repeated in order to create long term behavior change in an effort to prevent outbreaks over time (Cimolai, 2008; Salgado CD, 2003; Tacconelli, 2008). Universal education provides the necessary information to be disseminated while also creating a standard of care which is both reliable and consistent throughout the athletic community (Cohen, 1005;

Stevens M, 2008). The meticulous and consistent use of infection prevention strategies is critical to control outbreaks in the athletic population (Benjamin H, 2007). The data on the effectiveness of prevention strategies to prevent new and recurrent CA-MRSA infections is currently limited (Barr B, 2006; Rihn J, 2005; Stevens M, 2008). With an effort to standardize the prevention strategies utilized throughout Sports Medicine professionals a clear pathway is created to determine the most effective plans for prevention, treatment and long term control of risk factors.

Summary

Currently, more than half of all health-care associated staph infections in hospitals in this country are due to MRSA; however, over the past decade, MRSA infections have been increasingly recognized as a major problem in non-health care settings such as schools, and during athletic activities. Jails and prisons also have been increasingly recognized as locations where MRSA infections are found. Although MRSA and staph often colonizes humans without causing disease, they can be responsible for both minor skin infections and life-threatening infections of the skin, bone, joints, blood, heart valves, and lungs (Kowalski TJ, 2005; Lindenmayer JM, 1998; Malik S, 2009). MRSA and staphylococcus can be spread from person-to-person contact, with the skin of someone who is infected or colonized with the bacteria. These bacteria can also be acquired by contact with contaminated environmental surface(Cimolai, 2008). MRSA and staph bacteria are transmitted only by direct contact, and not through the air, coughing or breathing. If treated properly, through wound care and hygiene measures, most MRSA infections clear up within a few days. In more severe cases, MRSA can cause pneumonia, meningitis and even death. The incidence and risk of outbreak of CA-MRSA in athletics demonstrates the necessity that preventative measures be taken on a widespread level. While there is debate within the medical community about the most effective steps to take to

identify and prevent MRSA, it is clear that education for those involved regarding the unique characteristics of CA-MRSA infections is needed at all levels. This includes athletes, coaches, athletic trainers, and various healthcare personnel. To date, there is very little research or data about prevention measures and the effectiveness of various strategies. To that end, support for future research regarding person-to-person transmission and infection prevention measures is needed before CA-MRSA infections can be significantly reduced or eliminated in athletes.

Chapter 3

Methodology

Statement of Problem

The purpose of this study is to determine the perception to MRSA prevention strategies among certified Athletic Trainers in accordance with recommendations put forth by both the CDC and National Athletic Trainer's Association. Adherence to these recommendations are directly proportional to the perception of barriers and benefits to taking actions for prevention, recognition and treatment of MRSA infections. Determining the perception of threat and potential for adherence to protocols is necessary to further advance the standardization of care in infection control.

Research Questions

The following questions were addressed in this study:

1. Has the perception of MRSA, as a threat to athletic departments, changed since 2004?
2. What is the level of adherence of ATC's to consistent MRSA prevention strategies with respect to continued education of medical providers and patient education?
3. What do ATC's perceive as their responsibility for the adherence to prevention policy development?

Population and Sample

Subjects for this study are certified Athletic Trainers representing a cross section of University settings. The target population of Athletic Trainers in NCAA Division I, II, III offer insight into the potential for differences in perception of both the risk of CA-MRSA in their respective facilities as well as nationally. Each Division corresponds with different cultures of athletes as well as various experiences for health care workers with respect to overall workload, potential for burnout, resources and administrative support. Sport coverage of athletic trainers can vary between NCAA divisions (I-III) and may offer insight into potential barriers to prevention that can be evaluated. It is a common finding, which was supported through this research study that division III Athletic Trainers are often responsible for multiple sports in different seasons due to smaller medical staffs and less resources than larger division I Universities. This difference offers viewpoints that can vary in reception of new policy and necessity for additional supplies and administrative support. Therefore, the comparison between these demographic differences is important to evaluate.

The responses obtained from this instrument included 124 responses 70 male (56%) and 54 female (44%). Of this same sample 68% defined their positions as including at least 75% clinical work associated with direct patient care. The cross section of the sample population included 31 (25%) from Division I, 27 (22%) from Division II and 61 (49%) from Division III and 5 (4%) with no response. Number of sports covered included 9 (7%) cover only 1 sport, 19 (15%) covering 2 sports, and 16 (13%) covering 3 sports and 79 (64%) covering more than 3 sports.

Data Collection

IRB approval was obtained prior to the initiation of data collection by the office of research compliance on September 9, 2008 (IRB # 08-507). After IRB approval was obtained initial contact was made with subjects through electronic mail notification requesting participation in survey research. Target subjects were Athletic Trainers for Universities participating in the NCAA Divisions I, II, and III. Contact was made with Athletic Trainers through email request in context of a discussion group contact email. A follow-up email was sent 10 days after initial contact including direct links to the survey with request for participation. A final request was sent through the same email listserv requesting participation in the survey with direct link to survey location. Informed consent was defined by completion of the survey which was outlined in the request to each Athletic Trainer.

Data collection included completion of the survey via online correspondence. Following the reception of email through a sports medicine discussion group request form including a direct link to the survey respondents were able to read the consent form outlining the intention of the study and accept the terms of how the information will be used for educational purposes. Once data was collected the information was then stored on a secure server through survey.vt.edu. Upon completion of data collection the information was then collected on a protected and secure location where it will be maintained through password protected server located at www.filebox.vt.edu.

Instrumentation

The proposed instrument was intended to identify the most common perceptions of MRSA in the athletic community as well as the common perceptions of prevention strategies for general

infection control as well as specific MRSA strategies. The subjects outlined are the Athletic Trainers who are involved in policy development and supervision of prevention measures. These individuals have the most influence on the staff involved in daily care of athletes and recognition of potentially hazardous health conditions such as MRSA. This survey has been derived from several models which have been developed in healthcare field including nursing and general medicine (Brinsley K, 2005; D. M. Cabana M, 2002; Harris A, 2000; Q. D. Larson E, Giblin T, Lin S, 2007; Pessoa, 2005). These models have been tested for reliability and validity through various studies evaluating similar perceptions for policy development as well as guideline recommendations and standard procedures for prevention.

The survey used for data collection included the following questions through 6 point likert scale addressing the subjects of perception, awareness and formal policy development directed at infection control and CA-MRSA in the athletic medical setting.

Perception:

1. Antimicrobial resistance is a national problem
2. Antimicrobial resistance is a problem at my facility
3. There is a clear distinction between generalized antimicrobial resistance and MRSA.
4. MRSA is a problem in athletics nationally
5. MRSA is a problem at my facility
6. I am at risk for getting MRSA
7. My athletes are at risk for getting MRSA.
8. I feel that there is a realistic threat of a MRSA outbreak at my facility.

Guidelines for Infection Control:

1. I am familiar with the infection control guidelines in my field

2. There are so many guidelines available that it is nearly impossible to keep up.
3. In my field, I find that practice guidelines readily available
4. I don't have time to stay informed about available guidelines.
5. Guidelines are too "cookbook" and prescriptive
6. Practice guidelines are practical to use
7. Generally, practice guidelines are cumbersome and inconvenient
8. Guidelines are difficult to apply and adapt to my specific practice
9. In my organization, practice guidelines are important
10. Guidelines improve patient outcomes
11. Guidelines interfere with my professional autonomy
12. Generally, I would prefer to continue my routines and habits rather than to change based on guidelines
13. I am not really expected to use guidelines in my practice setting.
14. Publishing practice guidelines increases the risk of malpractice liability.
15. Guidelines help to standardize care and assure that patients are treated in a consistent way.
16. In my practice setting, there is sufficient administrative support and resources to allow the implementation of practice guidelines.
17. Athletes at my facility are generally aware of practice guidelines related to their condition.
18. Coaches at my facility are generally aware of practice guidelines related to their condition.

<u>Guidelines for MRSA prevention specifically:</u>

1. I am familiar with the official position statement on MRSA put forth by the NATA.
2. I am familiar with the CDC's recommended guidelines for the prevention of MRSA infections.
3. The official position statement on MRSA prevention from the NATA is readily available if I want to refer to it.

4. These recommendations are relevant to the athletic population I work with.
5. I feel that an official policy for the field of Athletic Training would be beneficial for reducing the risk of MRSA infections in the athletic population.
6. If we follow the recommended procedures in my practice setting, it is likely that MRSA risk will significantly decrease compared to our current procedures.
7. The costs of enacting MRSA prevention recommendations outweighs the benefits
8. The person I report to expects me to follow the MRSA prevention recommendations.
9. It is not really practical for me to follow MRSA prevention guidelines
10. At my facility we have other policies that may conflict with an official written MRSA prevention policy.
11. AT my facility we have a written policy based on the NATA and CDC position statements on prevention of MRSA infections.
    a. I am confident that the guidelines within the policy at my facility are based on sound scientific evidence
    b. The policy is readily available
    c. I have confidence that the developer of the policy at my facility is well qualified and knowledgeable about MRSA and prevention of MRSA.
12. Patient education is a primary concern to Athletic Trainers at my facility
13. Patient education materials are readily available in through various methods (audiovisual, pamphlet, direct instruction, team education, department education session, physician interaction)
14. I feel that patient education on precautions is vital to success of a MRSA prevention program or policy.
15. I feel that environmental decontamination is the most important aspect of prevention of MRSA outbreaks.
16. Patient education is important but not a primary concern in preventing transmission of MRSA.

<u>Professional Development:</u>

17. Professional development in MRSA prevention strategies would be most effective through the following methods

a. National Convention
b. Web-based education
c. NATA News article
d. Journal of Athletic Training supplement
e. Instruction from superiors
f. Other _____

Proposed Data Analysis

Data analysis was be conducted using SPSS for statistical calculation of mean, standard deviation for each category and item in addition to crosstabs to determine statistical differences between divisions and years of experience, gender, sports covered and clinical work percentage . This information was be used to determine statistically significant differences between preferred methods of prevention as well as established prevention plans and opinions of adherence to guidelines in general. This information was then be used to determine appropriate methods that can be recommended to increase overall awareness and adherence to MRSA prevention strategies. The overall intention of analysis for data gathered through this survey was to determine the need for specific guidelines for recognition, treatment and prevention of MRSA infections in an effort to standardize care throughout Athletic Training and sports medicine in the university and college setting. With the increased effort in standardizing care the incidence of MRSA in the close communities of athletics can be controlled in an effort to limit the endemic capacity of this infection.

Summary

The methods used to collect data and prepare statistical analysis have been developed with the guidance of the Health Belief Model in order to identify perceptions of threat and benefit to adherence to MRSA prevention recommendations and the perceptions of the need for more advanced directives in standard care guidelines in order to decrease the overall risk of transmission. Athletics has been effectively determined to be a threat to Athletic Departments nationwide for years. As the research develops more precise methods of identification and standards for treatment the efforts for prevention are less commonly addressed. The intention of the proposed research was to determine the need for standard care guidelines and potential for positive reception of such standards in the field of Athletic Training. As the primary healthcare professional involved in the treatment of athletes the efforts for prevention have the most significant potential for success or failure with this group of medical professionals. The adherence and general perception of both the current threat and necessity for continued efforts in prevention of transmission are significantly impacted at this level in the college and university setting. As standards are developed and adopted the precision with which the administration of new standards can then be effectively applied to various settings involving athletic participation to control the endemic qualities of this highly virulent infection.

Chapter 4

Results and Discussion

Analysis of sample

Appendix A demonstrates the frequency table incorporating results taken from the sample population comprised of 124 certified Athletic Trainers from NCAA Division I, II, and III colleges and Universities reported levels of experience ranging from 5 months to 40 years. The majority of responses reported from Athletic Trainers who report that their respective positions involve at least 75% or more clinical, which indicates that their direct patient interaction comprises most of their work. Out of 124 responses the sample group reported that 87% have had direct experience recognizing and/or treating MRSA infections. Only 8% reported no experience with recognition or treatment of MRSA infections. Similar results were reported regarding the awareness of the NATA recommendations for prevention of MRSA infections with 85% reporting awareness of the NATA recommendations.

Interestingly, the responses for formal policy development contrasted the general awareness. The percentage of responses indicating a formal policy for MRSA identification were 27%, with 66% reporting no formal policy developed at their institution. Similarly, 61% reported no formal policy had been developed for MRSA treatment with 31% reporting they did have a policy for treatment. In addition to these responses, 59% reported no formal policy was written for MRSA prevention procedures with 35% reporting that they did have a formal policy.

Appendix A further addresses infection control on a general level resulted in generally similar results throughout the sample population. The responses indicated that there is a positive understanding of the guidelines for infection control in allied health as a whole as well as Athletic Training with 52% agreement and 27% strong agreement with the question of awareness of infection control guidelines. Conversely, with a similar statement following up to the previous question describing the number of guidelines to follow and ability to "keep up" with all of them there was a lack of consensus – 27% disagree, 26% somewhat disagree, 27% somewhat agree, 9% agree. This indicates a possibly misunderstanding of the line of questioning. The availability of guidelines specific to Athletic Training being readily available was clearly understood and generally agreed with across the board with 32% somewhat agreeing, 41% agreeing, and 13% strongly agreeing. This provides the potential for positive reception of standard guidelines specific to infection control within the Athletic Training community. A potential barrier to this positive reception is noted in the next question which addresses the "time to stay informed" of practice guidelines for infection control. A lack of consensus was noted with these results with 44% disagreeing, 19% somewhat disagreeing, and 18% somewhat agreeing. Although these results appear to indicate that most of the target population does feel they have time to stay informed, without enough support to confirm statistical significance, there is not enough support to confirm this idea with absolute confidence. This leaves room for determining solutions through alternative forms of continued education for ease of information access.

The following three questions address preference of Athletic Trainers to working with protocols and guidelines in Athletic Training there was strong support on all questions indicating that this sample population does not feel that protocols are too prescriptive and furthermore do

not feel that these procedural instructions interfere with professional autonomy. This preference to work with standard protocols and guidelines indicates support of the development of protocols and specific standards for MRSA prevention and the potential for positive reception of these standards.

Practice settings with sufficient administrative support and resources for implementation of standard practice guidelines leaves additional room for potential barriers to be considered. This lack of administrative support and resources is apparent in the statistical analysis (See appendix A), illustrating a lack of consensus was reported with 12% reporting disagreement with their administrative support, 17% somewhat disagreeing and only 25% somewhat agreeing with their administrative support and 35% agreeing with their administrative support. Moving further in the investigation of institutional standards, the majority of responses indicate that athletes are generally aware of practice guidelines related to their conditions with 40% agreeing and 29% somewhat agreeing this indicates that athletes are generally being instructed in the standards of care which involves patient education. Conversely there is a lack of consensus in the coaches' awareness of practice standards. Coaches awareness of practice guidelines for their athletes were addressed with 16% disagreement, 12% somewhat disagreement, 33% somewhat agreement, and 28% agreement. While these results can be interpreted further with more specific questions of involvement, the general patient education does not appear to be extended as far as the coaching staff across the board. As coaches are considered part of the sports medicine team with input in athlete's participation levels and involvement, there is reasonable room for further discussion of the defining roles that coaches should play in the prevention of MRSA transmission involving their athletes and their role in the risk of transmission as well.

Personal perception yielded similar results as previous discussions that have addressed the perception of MRSA as a threat to both the nation and local athletic departments. While there was strong positive agreement that MRSA and antimicrobial resistance in general presents a national problem the threat on a local level consistently seems low. Only 6% agree, 2% strongly agree and 26% somewhat agree that MRSA presents a significant problem at their institution or athletic department. This opens the discussion again to the potential risks of other institutions that athletes inevitably will visit throughout the course of a season and how much of a threat the lack of consistent care and prevention efforts will be.

A potentially dangerous distinction that was not clearly defined in the results of this survey is the differences between threats to athletes and threat to healthcare workers. Although there is a clear risk related to both the distinction was not clearly defined in the survey results. A clear lack of statistically significant agreement to the statement "I am at risk for getting a MRSA infection as a healthcare worker" only 8% strongly agreed, 39% agreed, 34% somewhat agreed, 12% somewhat disagreed, and 5% disagreed. Conversely, 47% agreement, and 15% strongly agreed that athletes are at risk for getting MRSA.

The results from the next section of questions outlined by Appendix A directly addressing the expectations and perceptions of staff adherence are positive in their support of standard procedures and agreement that standard procedures have the potential for decreasing overall risk of transmission and incidence within athletics. Along similar lines the importance placed upon patient education is agreed upon by the majority as a vital aspect of prevention efforts; however the primary concern was placed on environmental decontamination. The most preferred methods of patient education ordered according to frequency of use include direct instruction (85%), team education (72%), pamphlets (63%), physician interaction (42%),

audiovisual materials (34%), department education sessions (24%) and computer based education (6%).

As a whole, the target population highlighted in this sample reported a lack of agreement when it came to the compliance of policies developed by their respective athletic departments with NATA/CDC recommendations. In addition there appears to be a lack of confidence in the current procedures for prevention of MRSA at their institutions. Interestingly, the responses regarding confidence in the individual ability of each respondent to develop their own procedures was in particularly high agreement. This information leads to the discussion of possible reasons why policies are not updated with more frequency and/or reasonable compliance with NATA/CDC recommendations. This leads to the next section of questions addressing the individual feelings of benefits that would be gained from continued education in MRSA prevention and awareness procedures. This information is a positive step in the direction of standard care and decreases the impact of potential barriers to behavior change in the adoption of standard MRSA prevention policy development. Similar responses were obtained from the responses to the benefits that would be gained by other athletic trainers at the institution or athletic department of each respondent.

The final aspect of evaluating the potential barriers to behavioral change is the methods of education for appropriate and accurate policy development. With a lack of agreement that in-house continued education is sufficient for MRSA prevention training, a positive response can be considered from the agreement that the NATA could take more initiative to increase awareness of the potential threat of MRSA. The preferred methods of professional development that could be used to address standardizing care in order of preference are: web-based education courses (35%), NATA News article, Journal of Athletic Training Supplement (20%), National

convention (15%), instruction from superiors (7%). This information can be effective in the development of programs to increase awareness and encourage positive behavior change.

Analysis of NCAA division

The most significantly positive finding in analysis of division produced results of strong disagreement with a ($p = .33$) for all divisions that practice guidelines for infection control are too prescriptive for Athletic Training [see AppenixB]. These results clearly demonstrate a distinctive preference for standard procedures and can lead to the conclusion that the development of standard guidelines and protocols would in fact be positively received at all levels of college and university athletic training. Further support of specific practice guidelines is demonstrated in the comparison of division and statement regarding the practicality of practice guidelines. All divisions reported strong agreement with a ($p = .045$) that practice guidelines are practical for use and indicates further support of positive reception of such standards.

Patient education on precautions regarding MRSA prevention as a vital aspect of overall care was strongly agreed upon in all divisions with a ($p = .001$) demonstrating the importance of including these procedures in standard guideline development. As patient education is a cornerstone of overall care and prevention the reception of these ideas does not appear to be a source of disagreement and should be met with positive results overall.

Analysis of geographic location

Geographic location yielded similar results as division; however the support of practice guidelines was apparent in the strong disagreement with the statement that indicated practice guidelines would be difficult to apply to clinical practice [See Appendix C]. Most reporting with disagreement overall and strong disagreement producing statistically significant results of chi-

square (p = .044) with 40 out of 124 responses. This supports the ease of acceptance that standards would be viewed with regardless of location.

A concerning and important statistic was apparent in the analysis of the staff's attention to detail in prevention procedures. Strong disagreement with this statement producing a (p = .000) shows that there is clear necessity for standard procedures to ensure that care is consistent throughout the university system to control outbreaks within each university setting as well as at other institutions.

Analysis of clinical work percentage

A very positive finding through statistical analysis was the strong agreement with Pearson chi-square (p = .046) with the statement that antimicrobial resistance is a national problem [See Appendix D]. This awareness of the magnitude of antimicrobial resistance is a positive step in the development of standard procedures for controlling transmission through more consistent efforts in prevention.

Another significant finding involves the preferred methods of professional development that could be used to educate professionals in Athletic Training of standardized procedures throughout the profession. The Athletic Trainers most involved in the daily patient care are those who spend at least 75% or more time with direct clinical work. Those professionals preferred web-based education courses at a significantly higher rate than all others. This (p = .26) shows the significance of these results and the clear preference for a less invasive method of information transfer.

Analysis of experience

Interestingly, the statistical analysis of experience produced significant results regarding the awareness of athletes of practice guidelines for their specific conditions [see Appendix E]. The years of experience most likely to strongly agree were within 1-10 years. The higher numbers of years of experience were less likely to have strong feelings of agreement or disagreement with this statement. The Pearson chi-square ($p = .000$).

Analysis of gender

Both men and women surveyed agree that they could develop standard procedures for prevention of MRSA with their teams [see Appendix F]. This statistically significant finding has a person chi-square ($p = .034$) with 3 degrees of freedom. This signifies that there is an overall comfort level with the standards that can be positively influenced in the development of standard protocols for the entire profession. Gender results were not otherwise statistically significant and offered similar responses throughout the survey in perception of prevention policy development, adherence and preference for guideline development.

Analysis of MRSA experience

Athletic Trainers surveyed with previous experience in recognizing and treating MRSA reported statistically significant positive results in agreement with the overall population results including time to stay informed ($p=.000$), preference to work with protocols ($p=.028$), practicality of practice guidelines ($p=.000$) and ease of use ($p=.000$) [see Appendix G] .

In opposition to the population results, awareness of athletes in reference to the practice guidelines for their conditions, there was varied results ranging from strongly agree to strongly

disagree with the most consistent results in somewhat disagreement with (p = .002). This leads to the conclusions that patient education must be emphasized in order to ensure success of protocol development for MRSA prevention.

A source of potential misunderstanding that must be addressed to limit potential barriers to behavior change in adoption of new standard protocols is the clear opposition in understanding the distinction between generalized antimicrobial resistance and MRSA. With equal strong disagreement and agreement with (p=.002), this topic must be included in education efforts in order to successfully influence the adoption of new procedures. Along similar lines with a statement concerning the quality of current procedures and their relative sufficiency in preventing MRSA outbreaks there is another statistically strong difference in perception. Equal reports of strong agreement and strong disagreement with a probability of .045, indicates that opinions of successful prevention can be significantly influenced with the adoption of standardized procedures along with education on current research. Along the same lines, a strong disagreement with the statement that current facility policies may conflict with a MRSA prevention policy indicates that the adoption of a formal policy has little chance to be met with resistance from institutional policy.

Analysis of sport coverage

Analysis of sport coverage yields results similar to division due to the comparison between number of sports covered and each division [see Appendix H]. The Athletic Trainers who cover at least 3 or more sports are largely associated with division III. Division I was the only division of athletics reporting sport coverage of only one sport. The most pertinent statistical analysis of sports covered was the strong difference in perception of resources and

administrative support. An even difference between strong agreement and strong disagreement (p=.000) indicates that further investigation of the resources and administrative support each university has for policy development may need to be completed in order to minimize the resistance to necessary changes for successful MRSA prevention.

Results of analysis of the question regarding the perceived benefits of an official policy being developed for reducing the risk of MRSA infections in the athletic population yielded results of strong agreement in all groups with a probability of .020. These results indicate that with the development of an official policy the resistance would be minimal from Athletic Trainer who covers one sport as positively as those who cover more than three sports.

Chapter 5

Conclusions and Recommendations

Research Questions

Research question one poses the question of how perception of MRSA as a threat has changed since 2004. In 2004, a web-based survey was conducted with the NATA to determine the general level of awareness pertaining to MRSA. Since 2004, according to the study's results, awareness of the threat that CA-MRSA presents to the athletic community has increased substantially--from 24% to 80%. In addition to trainers' awareness of the disease itself, it was also noted that the CDC's recommendations for preventing MRSA also increased among this study population. Unfortunately, though it is widely accepted that MRSA does present a threat to the athletic community, this has not lead to policy development supporting standard prevention procedures. Likewise, there is still no clear support for standard practice procedures. The survey established a clear preference for working within practice guidelines and protocols, even though policies have not been established to standardize procedures for prevention, recognition or treatment of MRSA. Even as awareness increases, the lack of policy development allows leads to inconsistent prevention efforts, and the continued transmission of MRSA throughout athletic environments. This is an important consideration in the approach that Athletic Training takes in controlling MRSA. The most successful MRSA prevention efforts are consistent, and centered around clear and distinct policies that leave no question surrounding the

proper actions to be taken by medical professionals (Gould, 2002; Q. D. Larson E, Giblin T, Lin S, 2007; Tacconelli, 2008). In order to provide consistent and quality care to high-risk populations of athletes, there is a very real need for the development of standard policy in Athletic Training,

As the MRSA threat is increasingly recognized, proportional responses must also incorporate the recognition of efforts to control the potential threat. Compared to the national level, the threat of MRSA at a local level, where questionable practices of prevention and perception of the disease, pose difficult challenges is an area that requires immediate change in formal policy. Although there is a general awareness that MRSA is a realistic threat to athletic environments, the threat of local outbreak is still recognized as relatively low. How effective, then, are standard prevention procedures among medical staff members on a daily basis? This is addressed with my second research question included in this survey. The second research question attempts to determine the general adherence level of athletic trainers to consistent MRSA prevention strategies, with respect to continued education of medical providers and patient education. The two most preferred methods of patient education reported in this study were direct instruction and physician interaction. These efforts, although beneficial to individuals to whom they are introduced, lack the standard knowledge base that creates environments that effectively prevent a large percentage of this virulent infection. When general awareness is addressed, the recognition of risk behaviors as well as reduction of risk with environmental considerations is reduced (Kurkowski, 2007). This is only effective when there is community understanding. The direct instruction method is generally used in response to a sudden MRSA episode or when individuals are recognized as particularly high-risk. This method does not incorporate the education of individuals who may not have a previous

experience with MRSA on which to base understanding of prevention. In order to effectively prevent MRSA, multiple methods of prevention education may offer the most effective method for transferring knowledge. With this, various learning styles and convenience of information transfer can be considered. With more methods enacted in an effort to increase awareness of high-risk communities (such as athletics), there will be more meaning to MRSA education. Because the majority of responses in this line of questions yielded results indicating that patient education is a fundamental and necessary aspect of MRSA prevention it is imperative that responsible athletic trainers educate themselves about how to educate the community.

The third research question addressed the perceived sense of responsibility for adherence to prevention policy development for athletic trainers. Athletic trainers consistently reported the preference for working within guidelines, with a strong preference for face-to-face interaction through a physician for patient education. Further investigation is needed to determine the extent to which ATCs take ownership that in their efforts for action and support of standards of MRSA prevention on a consistent basis. The results indicate that the majority of athletic trainers surveyed felt comfortable developing their own policies for MRSA prevention, in reference to the teams they are directly responsible for. This is surprising in lieu of the lack of policy development for these prevention strategies. Athletic trainers appear to be aware of the problem that MRSA poses a threat to the athletic community. They are aware that taking action to prevent outbreaks is a reasonable expectation, which is a positive start to controlling this infection. With that, the next step in prevention, which is vital to long-term success, is policy development which standardizes care and creates an environment where the prevention strategies offered by the CDC become routine and are not overlooked due to lack of regulation. With standards that can be followed and evaluated, the risk of outbreaks can be controlled. The results

reported, regarding administrative support and supplies, did not indicate significant problem areas for most college/university settings. Without this potential barrier to success, the process of policy development can now be addressed leading to immediate positive results from required behavioral changes. The responsibility of athletic trainers should be capitalized upon in the form of directed education and prevention training and should be addressed immediately as the threat of MRSA continues to increase in the athletic community. As the "gatekeepers" for medical care of athletes in the college and university setting, athletic trainers should be extremely influential in efforts to standardize care.

Discussion of ATC perception

The information gathered through this study has revealed that athletic trainers in the collegiate setting have a basic understanding of the presence of CA-MRSA in the athletic environment. According to the data received in this study, the threat of MRSA is recognized as a national problem. These results are positive when considering the increasing prevalence of MRSA; however, problems arise from a lack of consistent policy development and recognition of this problem on a local level. The threat of MRSA is not generally recognized as a problem by individual athletic trainers. This indicates that the threat is still being perceived as "minor", in daily functioning. In reality, the threat of MRSA is a constant problem, which does not decrease when formal recommendations offered from various national disease control references are disregarded. Because of this, threat of MRSA continues to rise and must be addressed with the education of to the athletic community. For adherence to any formally developed guidelines, it is necessary to recognize that both home and away events are environments of exposure that have the potential to initiate an outbreak of MRSA.

As outlined through the analysis of perception data in this study, the general perception of athletic trainers is that the actions taken by staff on a local level is sufficient for prevention of outbreaks. As the rate of outbreaks in close communities such as athletic teams continues to present a problem, the necessity for recognition of the continued problem and need for daily practices to change is vital. The recognition of MRSA as a threat is the only way to develop behavior change, while also considering the resources and available cues to action that can influence the development of new behaviors. This is the way to enhance the prevention strategies suggested by the CDC.

Guidelines and standards of practice, at this point, are expected but not required. The development of standard guidelines and practice procedures involving protocol would offer a stricter action plan to guide behaviors. Some behaviors may seem basic and common knowledge procedures; however, until there is a written standard requiring behaviors, while offering consequences to negligence, the changes will not seem necessary. It is easy to allow daily routine to influence and negate the practice standards and prevention strategies that are reviewed when outbreaks occur; however, in order to prevent transmission from occurring, the prevention strategies that have been offered must be continually followed and re-visited. If yearly, monthly, or weekly educational opportunities are not offered and/or required, reminders for expected behaviors may often be taken for granted and not followed with specificity. The current study offered some insight into the "attention to detail" each staff practiced when executing behaviors associated with infection control. The insight into this aspect of MRSA prevention allows further investigation that may be extremely influential in determining the precision with which athletic trainers are utilizing in infection control and MRSA prevention in an effort to improve standards of care.

Discussion of Formal policy development

With the increased threat of MRSA recognized, athletic trainers in clinical settings have indicated their preference and comfort of working within the confines of protocols and guidelines. This positive reception of standardizing care offers important insight into the possible adherence that could be followed by athletic trainers if MRSA prevention protocols are developed and offered to sports medicine professionals. As a professional offering the primary recognition of potentially hazardous situations and charged with minimizing the risk of injury and illness, athletic trainers have an important role in the control of MRSA transmission. With the development of formal policy and standardized behaviors through these policies athletic trainers would have an opportunity to actively engage in and offer valuable clinical insight into the most successful practices in preventing disease transmission. If a professional task force and board of professionals is developed and given the task of developing a standard procedure for the prevention of MRSA, athletic trainers would no longer have to trust suggested behaviors, which may or may not be followed by other universities and professionals. This formal policy development would also offer motivation for adherence with the opportunity for consequences and lead to more consistent prevention behaviors which would increase disease transmission risk.

Discussion of Continuing Education

The preference for specific types of information distribution identifies a potential barrier to the success or failure of policy development. In order for behavior change to occur, critical information regarding the threat of MRSA and the benefits of adherence to standards of prevention and behaviors directed towards preventing disease transmission is necessary. The

preferences offered through this study largely included online or web-based education. This method is easy to use by time-constrained athletic trainers; however it raises the question of the efficacy of information transfer when the self-guided methods are offered on a relatively informal basis. The convenience may offer some increased preference for inclusion in various programs, however the quality of information being offered may be questionable.

It seems that face-to-face interaction of traditional educational settings is the most effective method of teaching, which leads to the next question. How this can effectively occur? Realistically, there must be inclusion of policies developed and offered through education of athletic trainers currently completing entry-level education programs. The next level of information distribution preferred is the online or web-based course with additional information offered in various print methods for current members of the NATA. Further study would be beneficial in determining the most effective method for transfer of educational information regarding policy development.

Discussion of Future Development / Research

The length of this online survey may have led to limited response rates and relative misunderstanding of several questions due to the number of issues being addressed. In order to effectively follow up on several important points highlighted through this research, limiting the length of follow-ups may increase responses and quality of responses. Development of follow-up studies should include smaller, specifically-outlined questions that are directed at the adherence and perception of policy development and further in the specific necessity for areas requiring policy development related to infection control. Observational studies as well as quantitative culture studies of environmental risk would further support the actions that could be

taken into consideration for formal policy development in the control and eradication of MRSA outbreaks altogether. The number of responses obtained in this study offers a barrier to clear perceptions. Extending the length of time that data collection is completed offers the opportunity for additional information to be offered as incentive for completion of the study.

References

Abrahamian R, S. E. (2007). Community acquired-methicillin resistant staphylococcus arueus: clinical presentation and treatment decisions. *current Inf Dis Reports, 9*(39), 391-397.

Advic E, C. S. (2008). Management and control strategies for community acquired methicillin resistant saphylococcus Aureus. . *Expert Opin. Pharmacother., 9*(9), 1463-1479.

Afif W, H. P., Brassard P, Loo V. (2002). Compliance with methicillin resistant staphylococcus Aureus precautions in a teaching hospital. *AJIC, 30*(7), 430-433.

Appelbaum, P. (2006). MRSA-the tip of the iceberg. *Clin Microbiol. Infect, 12*(2), 3-10.

Barr B, F. M., Diamond P. . (2006). High school athletic departments as sentinel surveillance sites for CA-MRSA infections. *Tex Med., 102*(4), 56-61.

Beam J, B. B. (2006). CA-MRSA: prevalence and risk factors. . *JAT, 41*(3), 337-340.

Begler E, e. a. (2004). A high morbidity outbreak of MRSA among players in a college football team, facilitated by cosmetic body shaving and turf burns. . *Clin Inf Dis, 17*, 393-397.

Benjamin H, N. V., Takagishi J. . (2007). Practical management: community acquired methicillin resistant staphylococcus Aureus: the latest sports edpidemic. . *Clin J Sports Med, 17*, 393-397.

Boucher H, C. R. (2008). Epidemiology of methicillin resistant staphylococcus Aureus. . *Clin Inf Dis, 46*(S), 344-349.

Brinsley K, S.-c. R., Cardo D. . (2005). The CDC campaign to prevent antimicrobial resistance team. Assessing motivation for physicians to prevent antimicrobial restistnace in hospitalized children using the health belief model as a framework. . *Am J Inf contr, 33*, 175-181.

Cabana M. (1998). Barriers to Guideline Adherence. *AJMC, 4*(12S), S741-748.

Cabana M, D. M. (2002). Improving physician adherence to cholesterol management guidelines. . *Managed care, 11*(10), 18-22.

Cauda R, G. J. (2009). New insights concerning methicillin-resistant Staphylococcus Aureus disease. *clin Microbiol Infect, 15*(2), 109-111.

CDC. (2008, 9/11/2008). CA-MRSA. *National MRSA Education Initiative: Preventing MRSA Skin Infections* Retrieved June 30, 2008, from http://www.cdc.gov/mrsa/mrsa_initiative/skin_infection/index.html

Chi C, W. W., Fung C, Yu K, Liu C. . (2004). Epidemiology of community-acquired staphylococcus Aureus bacteremia. . *J Microbiol immunol infect, 37*, 16-23.

Cimolai, N. (2008). MRSA and the environment: implications for comprehensive control measures. . *Eur J Clin Miocrobiol Infect Dis, 27*(7), 481-493.

Cohen, P. (1005). Cutaneous CA-MRSA infection in participants of athletic activities. *South Med Journ, 98*(6), 596-599.

Coia J, D. G., Edwards D, et al. . (2006). Guidelines for the control and prevention of Methicillin resistant staphylococcus Aureus (MRSA) in healthcare facilities. . *J Hop Infect., 63*(S), 140-144.

Cosgrove S, Q. Y., Kaye K, Harbarth S, Karchmer A, Carmeli Y. (2006). the impact of methicillin resistance in outcomes mortality, length of hospital stay and hospital charges. *Inf control Hosp epidemiol., 27*(9), 994-995.

Courtney, K. (1994). Athletic trainers can impact health promotion and disease prevention. . *JAT, 29*(3), 238-243.

Easton P, e. a. (2007). Infection control and management of MRSA: assessing knowledge of staff in an acute hospital setting. . *J Hop Infect., 66*, 29-33.

Elston D. (2008). Handling a Community-Acquired Methicillin-Resistant Staphylococcus Aureus Outbreak: Emerging Data. *Cutis, 82*(2), 13-17.

Farrington, M. (2007). Infection control education: how to make an impact - tools of the trade. . *J Hop Infect., 65*(S2), 128-132.

Farrington M, T. C., Redpath. (2000). Effects on nursing workload of different MRSA control strategies. *J Hop Infect., 46*, 118-122.

Francois P, H. S., Huyghe A, Renzi G, Bento M, Gervaix A, Pittet D, Schrenzel J. (2008). Methicillin-Resistant Staphylococcus Aureus, Geneva, Switzerland, 1993-2005. *Emerg Inf Dis, 14*(2), 304-307.

Garau J, B. E., Chastre J, Gudiol F, Harbarth S. (2009). Management of methicillin-resistant Staphylococcus Aureus infections. *Clin Microbiol Infect, 15*(2), 125-136.

Giblin T, e. a. (2004). Clinicians perceptions of the problem of antimicrobial resistance in healthcare facilities. . *Arch Intern Med, 164*, 1662-1668.

Glanz K, L. F., Rimer BK. . (2002). *Health Behavior and Health Education: Theory, Research and Practice*. San Fransisco: Wiley and Sons.

Goding A, R. K., Cochran R, Hageman J. . (2007). Athletic trainers and MRSA infections: what's the score. *NATA News*(5), 12-15.

Gould, I. (2002). Antibiotic policies and control of resistance. *curr opin Infect dis, 15*, 395-400.

Harris A, e. a. (2000). Survey of hand washing practices and opinion of health care workers. . *J Hop Infect., 45*, 318-321.

Henderson. (2006). Managing Methicillin -resistant staphylococcus Aureus-a paradigm for preventing nonsocomial transmission. *AJOM, 119*(5A), S45-S52.

Herman R, K. V., Moores K, Ross M. (2008). Etiology and treatment of CA-MRSA. . *Am J Hlth Syst Pharm, 65*(3), 219-225.

Hilts, A. (2006). The evolution of community-Acquired gram positive resistance. *Pharmacology* Retrieved 7/11, 2007, from http://sss.rxschool.com/users/Course/batch_print.cfm?COURSE_ID=40

Humphreys H, G. H., Skov R, Lucet JC, Cauda R. (2009). Prevention and control of methicillin-resistant Staphylococcus Aureus. *Clin Microbiol Infect, 15*(2), 120-124.

Klein E, S. D., Laxminarayan R. (2007). Hospitalizations and deaths caused by methicillin-resistant staphylococcus Aureus, US 1999-2005. *Emerg Inf Dis, 13*(12), 1840-1846.

Klevins R, e. a. (2007). Invasive Methicillin resistant staphylococcus Aureus infections in the US. *JAMA, 198*(15), 1763-1771.

Kowalski TJ, B. E., Osmon DR. (2005). Epidemiology, treatment, and prevention of community-acquired methicillin-resistant Staphylococcus Aureus infections. *Mayo Clin Proc, 80*, 1201-1208.

Kurkowski, C. (2007). The new sports pathogen. *Orthop Nurs, 26*(5), 310-314.

Larson, E. (2003). Status of practice guidelines in the US: CDC guidelines as an example. *Preventative Medicine, 36*, 519-524.

Larson E, K. E. (1995). Compliance with hand washing and barrier precautions. . *J Hop Infect., 30*(88-106).

Larson E, Q. D., Giblin T, Lin S. (2007). Relationship of Antimicrobial Control Policies and Hospital and Infection Control Characteristics to Antimicrobial Resistance Rates. *Am J Crit Care, 16*, 110-120.

Lindenmayer JM, S. S., O'Grady R, Carney JK. (1998). Methicillin-resistant Staphylococcus Aureus in a high school wrestling team and the surrounding community. *Arch Intern Med, 158*(8), 895-899.

Lodise T, M. P. (2005). Clinical and economic impact of Methicillin resistance in patients with staphylococcus Aureus bacteremia. *Diag Microbiol and Inf Dis, 52*, 113-122.

Malik S, V. P., Silio M, Ratard R, VAN Dyke R. (2009). Prevalence of community-associated methicillin-resistant Staphylococcus Aureus colonization outside the healthcare environment. *epidemiol infect, [Epub ahead of print]*, 1-5.

Marcotte, A. (2008). CA-MRSA: an emerging pathogen in orthopaedics. *Am J Acad Ortho Surg, 16*(98-106).

Moran G, K. A., Gorwitz R, Fosheim G, McDougal L, Carey R, Talan D. (2006). Methicillin resistant S Aureus infections among patients in the emergency department. *N Engl J Med, 17*(7), 666-674.

Naimi T, l. K. (2003). Comparison of CA and HC MRSA infection. *JAMA, 290*, 1976-1984.

Nguyen DM, M. L., Bancroft E. (2005). Recurring methicillin-resistant Staphylococcus Aureus infections in a football team. *Emerg Infect Dis, 11*, 526-532.

Paez A, S. D. (2008). Methicillin resistant staphylococcus Aureus - from the hospital to the community. *Current Inf Dis Reports, 10*(1), 14-21.

Painter J, B. C., Hynes M, Mayes D, glanz K. (2008). The use of theory in health behavior research from 2000 to 2005: a systematic review. *Ann Behav Med, 35*(3), 358-362.

Pessoa. (2005). Attitudes and perceptions toward hand hygiene among HC workers caring for critically-ill. *Inf control Hosp epidemiol., 21*, 305-311.

Popovich K, H. B. (2008). Treatment and prevention of CA-MRSA skin and soft tissue infections. *Dermatologic Therapy., 21*(167-179).

Prevention, C. f. D. C. a. (2003). Methicillin-resistant Staphylococcus Aureus infections among competitive sports participants—Colorado, Indiana, Pennsylvania, and Los Angeles county, 2000-2003. *MMWR Morb Mortal Wkly Rep, 52*, 793-795.

Rihn J, M. M., Harner C. (2005). Community acquired methicillin resistant staphylococcus Aureus - an emerging problem in the athletic population. *Am J Sports Med, 33*(12), 1924-1929.

Romano R, L. D., Holtom P. (2006). Outbreak of community-acquired methicillin-resistant Staphylococcus Aureus skin infections among a collegiate football team. *JAT, 41*(2), 141-145.

Rosenstock, I. (1974). *The health belief model and personal health behavior*. New Jersey: Slack.

Salgado CD, F. B., Calfee DP. (2003). Community-acquired methicillin-resistant Staphylococcus Aureus: a meta-analysis of prevalence and risk factors. *Clin Inf Dis, 36*, 131-139.

Sedgwick P, D. W., Smith C. (2007). Bacterial dermatosis in sports. *Clin J Sports Med, 17*(5), 383-396.

Stevens M, B. G., Rostao A, Edmond M. (2008). Community acquired methicillin resistant staphylococcus Aureus in a collegiate women's basketball player. *South Med Journ, 101*(10), 1067-1068.

Stryjewski ME, C. H. (2008). Skin and Soft-Tissue Infections Caused by Community-Acquired Methicillin-Resistant Staphylococcus Aureus. *Clin Inf Dis, 46*, S368-377.

Tacconelli, E. (2008). Methicillin-resistant Staphylococcus Aureus: risk assessment and infection control policies. *Clin micro inf, 14*(5), 407-410.

Tubeville S, C. L., Greenfield R. (2006). Infectious Disease Outbreaks in competitive Sports. *AJOSM, 34*(11), 1860-1865.

Wolf R, L. D., Cochran R, Richards C. (2008). Nursing Staff Perceptions of Methicillin-resistant staphylococcus Aureus and infection control in a long term care facility. *JAMDA, 9*, 342-346.

Appendix A - Frequencies

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	54	43.5	43.5	43.5
	Male	70	56.5	56.5	100.0
	Total	124	100.0	100.0	

Experience					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		4	3.2	3.2	3.2
	09	1	.8	.8	4.0
	1	1	.8	.8	4.8
	10	7	5.6	5.6	10.5
	11	6	4.8	4.8	15.3
	12	1	.8	.8	16.1
	13	3	2.4	2.4	18.5
	14	6	4.8	4.8	23.4
	15	6	4.8	4.8	28.2
	16	3	2.4	2.4	30.6
	17	1	.8	.8	31.5
	18	3	2.4	2.4	33.9
	19	2	1.6	1.6	35.5
	2	5	4.0	4.0	39.5
	20	6	4.8	4.8	44.4
	22	1	.8	.8	45.2
	23	2	1.6	1.6	46.8
	24	3	2.4	2.4	49.2
	25	1	.8	.8	50.0
	26	1	.8	.8	50.8
	28	4	3.2	3.2	54.0
	3	11	8.9	8.9	62.9
	3.5	1	.8	.8	63.7
	31	1	.8	.8	64.5
	33	1	.8	.8	65.3
	4	8	6.5	6.5	71.8
	4.5	1	.8	.8	72.6
	40	2	1.6	1.6	74.2

	5	11	8.9	8.9	83.1
	5 months	1	.8	.8	83.9
	6	7	5.6	5.6	89.5
	8	5	4.0	4.0	93.5
	9	8	6.5	6.5	100.0
	Total	124	100.0	100.0	

Clinical Work %					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.8	.8	.8
	0%	18	14.5	14.5	15.3
	100%	49	39.5	39.5	54.8
	25%	5	4.0	4.0	58.9
	50%	16	12.9	12.9	71.8
	75%	35	28.2	28.2	100.0
	Total	124	100.0	100.0	

Division					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		5	4.0	4.0	4.0
	Division I	31	25.0	25.0	29.0
	Division II	27	21.8	21.8	50.8
	Division III	61	49.2	49.2	100.0
	Total	124	100.0	100.0	

State					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	1.6	1.6	1.6
	AK	1	.8	.8	2.4
	AL	4	3.2	3.2	5.6
	AR	2	1.6	1.6	7.3
	CT	4	3.2	3.2	10.5
	DC	1	.8	.8	11.3
	FL	8	6.5	6.5	17.7
	GA	4	3.2	3.2	21.0
	HI	1	.8	.8	21.8
	IA	1	.8	.8	22.6
	ID	1	.8	.8	23.4
	IL	5	4.0	4.0	27.4

	IN	1	.8	.8	28.2
	KS	1	.8	.8	29.0
	KY	5	4.0	4.0	33.1
	LA	1	.8	.8	33.9
	MA	7	5.6	5.6	39.5
	MD	8	6.5	6.5	46.0
	ME	4	3.2	3.2	49.2
	MI	1	.8	.8	50.0
	MN	2	1.6	1.6	51.6
	MO	1	.8	.8	52.4
	MT	1	.8	.8	53.2
	NC	2	1.6	1.6	54.8
	ND	1	.8	.8	55.6
	NH	3	2.4	2.4	58.1
	NM	1	.8	.8	58.9
	NY	11	8.9	8.9	67.7
	OH	11	8.9	8.9	76.6
	PA	12	9.7	9.7	86.3
	SC	1	.8	.8	87.1
	SD	1	.8	.8	87.9
	TN	5	4.0	4.0	91.9
	TX	3	2.4	2.4	94.4
	VA	5	4.0	4.0	98.4
	VT	1	.8	.8	99.2
	WI	1	.8	.8	100.0
	Total	124	100.0	100.0	

Experience with MRSA					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	1.6	1.6	1.6
	No	10	8.1	8.1	9.7
	Unsure	4	3.2	3.2	12.9
	Yes	108	87.1	87.1	100.0
	Total	124	100.0	100.0	

# of Sports					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.8	.8	.8
	1	9	7.3	7.3	8.1

	2	19	15.3	15.3	23.4
	3	16	12.9	12.9	36.3
	more than 3	79	63.7	63.7	100.0
	Total	124	100.0	100.0	

Familiar with NATA position Statement					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.8	.8	.8
	No	9	7.3	7.3	8.1
	Unsure	8	6.5	6.5	14.5
	Yes	106	85.5	85.5	100.0
	Total	124	100.0	100.0	

Formal policy for MRSA identification					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	82	66.1	66.1	66.1
	Unsure	9	7.3	7.3	73.4
	Yes	33	26.6	26.6	100.0
	Total	124	100.0	100.0	

Formal policy for MRSA treatment					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	76	61.3	61.3	61.3
	Unsure	9	7.3	7.3	68.5
	Yes	39	31.5	31.5	100.0
	Total	124	100.0	100.0	

Formal policy for MRSA prevention					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	73	58.9	58.9	58.9
	Unsure	8	6.5	6.5	65.3
	Yes	43	34.7	34.7	100.0
	Total	124	100.0	100.0	

I am familiar with the infection control guidelines in Athletic Training and Allied Health.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		2	1.6	1.6	1.6
	agree	65	52.4	52.4	54.0

	disagree	2	1.6	1.6	55.6
	somewhat agree	17	13.7	13.7	69.4
	strongly agree	33	26.6	26.6	96.0
	strongly disagree	5	4.0	4.0	100.0
	Total	124	100.0	100.0	

There are so many guidelines to follow it is unreasonable to try to keep up with everyone.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	11	8.9	8.9	8.9
	disagree	33	26.6	26.6	35.5
	somewhat agree	34	27.4	27.4	62.9
	somewhat disagree	32	25.8	25.8	88.7
	strongly agree	6	4.8	4.8	93.5
	strongly disagree	8	6.5	6.5	100.0
	Total	124	100.0	100.0	

In Athletic Training, I feel that standard practice guidelines are readily available.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	51	41.1	41.1	41.1
	disagree	5	4.0	4.0	45.2
	somewhat agree	40	32.3	32.3	77.4
	somewhat disagree	11	8.9	8.9	86.3
	strongly agree	16	12.9	12.9	99.2
	strongly disagree	1	.8	.8	100.0
	Total	124	100.0	100.0	

I do not feel that I have time to stay informed about practice guidelines for infection control.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		1	.8	.8	.8
	agree	5	4.0	4.0	4.8
	disagree	55	44.4	44.4	49.2
	somewhat agree	22	17.7	17.7	66.9
	somewhat disagree	24	19.4	19.4	86.3
	strongly disagree	17	13.7	13.7	100.0
	Total	124	100.0	100.0	

Practice guidelines for infection control are too prescriptive for Athletic Training.					
		Frequency	Percent	Valid Percent	Cumulative

Valid	agree	5	4.0	4.0	4.0
	disagree	48	38.7	38.7	42.7
	somewhat agree	18	14.5	14.5	57.3
	somewhat disagree	42	33.9	33.9	91.1
	strongly agree	1	.8	.8	91.9
	strongly disagree	10	8.1	8.1	100.0
	Total	124	100.0	100.0	

I prefer to work without protocols and guidelines because they are inconvenient and cumbersome.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	2	1.6	1.6	1.6
	disagree	57	46.0	46.0	47.6
	somewhat agree	7	5.6	5.6	53.2
	somewhat disagree	18	14.5	14.5	67.7
	strongly disagree	40	32.3	32.3	100.0
	Total	124	100.0	100.0	

I feel practice guidelines are practical to use.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	71	57.3	57.3	57.3
	disagree	3	2.4	2.4	59.7
	somewhat agree	30	24.2	24.2	83.9
	somewhat disagree	6	4.8	4.8	88.7
	strongly agree	14	11.3	11.3	100.0
	Total	124	100.0	100.0	

Practice guidelines are difficult to apply and adapt to my specific practice.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	3	2.4	2.4	2.4
	disagree	65	52.4	52.4	54.8
	somewhat agree	18	14.5	14.5	69.4
	somewhat disagree	24	19.4	19.4	88.7
	strongly agree	4	3.2	3.2	91.9
	strongly disagree	10	8.1	8.1	100.0
	Total	124	100.0	100.0	

Guidelines are difficult to apply to Athletic Training practice.					
		Frequency	Percent	Valid Percent	Cumulative

Valid		1	.8	.8	.8
	agree	3	2.4	2.4	3.2
	disagree	63	50.8	50.8	54.0
	somewhat agree	18	14.5	14.5	68.5
	somewhat disagree	23	18.5	18.5	87.1
	strongly disagree	16	12.9	12.9	100.0
	Total	124	100.0	100.0	

Guidelines interfere with my professional autonomy.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	disagree	66	53.2	53.2	53.2
	somewhat agree	8	6.5	6.5	59.7
	somewhat disagree	19	15.3	15.3	75.0
	strongly disagree	31	25.0	25.0	100.0
	Total	124	100.0	100.0	

Guidelines help to standardize care and assure that patients are treated in a consistent way.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	72	58.1	58.1	58.1
	somewhat agree	18	14.5	14.5	72.6
	strongly agree	34	27.4	27.4	100.0
	Total	124	100.0	100.0	

In my practice setting, there is sufficient administrative support and resources to allow the implementation of practice guidelines.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	43	34.7	34.7	34.7
	disagree	15	12.1	12.1	46.8
	somewhat agree	31	25.0	25.0	71.8
	somewhat disagree	21	16.9	16.9	88.7
	strongly agree	9	7.3	7.3	96.0
	strongly disagree	5	4.0	4.0	100.0
	Total	124	100.0	100.0	

Athletes at my facility are generally aware of practice guidelines related to their specific conditions.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		1	.8	.8	.8
	agree	50	40.3	40.3	41.1

	disagree	14	11.3	11.3	52.4
	somewhat agree	36	29.0	29.0	81.5
	somewhat disagree	14	11.3	11.3	92.7
	strongly agree	7	5.6	5.6	98.4
	strongly disagree	2	1.6	1.6	100.0
	Total	124	100.0	100.0	

Coaches at my facility are generally aware of practice guidelines related to the specific conditions of the					
		Frequency	Percent	Valid Percent	Cumulative
Valid		1	.8	.8	.8
	agree	35	28.2	28.2	29.0
	disagree	20	16.1	16.1	45.2
	somewhat agree	41	33.1	33.1	78.2
	somewhat disagree	15	12.1	12.1	90.3
	strongly agree	8	6.5	6.5	96.8
	strongly disagree	4	3.2	3.2	100.0
	Total	124	100.0	100.0	

Antimicrobial Resistance is a national problem					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid		1	.8	.8	.8
	Agree	52	41.9	41.9	42.7
	Disagree	2	1.6	1.6	44.4
	somewhat agree	21	16.9	16.9	61.3
	somewhat disagree	6	4.8	4.8	66.1
	strongly agree	42	33.9	33.9	100.0
	Total	124	100.0	100.0	

MRSA presents a serious threat to Athletic Departments and Athletic Trainers nationwide.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	50	40.3	40.3	40.3
	disagree	1	.8	.8	41.1
	somewhat agree	27	21.8	21.8	62.9
	somewhat disagree	7	5.6	5.6	68.5
	strongly agree	38	30.6	30.6	99.2
	strongly disagree	1	.8	.8	100.0
	Total	124	100.0	100.0	

Antimicrobial Resistance is a problem at my facility.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	Agree	7	5.6	5.6	5.6
	Disagree	38	30.6	30.6	36.3
	somewhat agree	33	26.6	26.6	62.9
	somewhat disagree	33	26.6	26.6	89.5
	strongly agree	4	3.2	3.2	92.7
	strongly disagree	9	7.3	7.3	100.0
	Total	124	100.0	100.0	

MRSA Presents a significant problem at my institution/Athletic department					
		Frequency	Percent	Valid Percent	Cumulative
Valid		1	.8	.8	.8
	agree	8	6.5	6.5	7.3
	disagree	45	36.3	36.3	43.5
	somewhat agree	32	25.8	25.8	69.4
	somewhat disagree	25	20.2	20.2	89.5
	strongly agree	3	2.4	2.4	91.9
	strongly disagree	10	8.1	8.1	100.0
	Total	124	100.0	100.0	

There is a clear distinction between generalized antimicrobial resistance and MRSA.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		2	1.6	1.6	1.6
	agree	23	18.5	18.5	20.2
	disagree	19	15.3	15.3	35.5
	somewhat agree	31	25.0	25.0	60.5
	somewhat disagree	45	36.3	36.3	96.8
	strongly agree	3	2.4	2.4	99.2
	strongly disagree	1	.8	.8	100.0
	Total	124	100.0	100.0	

I am at risk for getting a MRSA infection as a healthcare worker.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		1	.8	.8	.8
	agree	48	38.7	38.7	39.5
	disagree	6	4.8	4.8	44.4
	somewhat agree	42	33.9	33.9	78.2
	somewhat disagree	15	12.1	12.1	90.3

	strongly agree	10	8.1	8.1	98.4
	strongly disagree	2	1.6	1.6	100.0
	Total	124	100.0	100.0	

My athletes are at risk for getting MRSA infections.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	58	46.8	46.8	46.8
	disagree	4	3.2	3.2	50.0
	somewhat agree	34	27.4	27.4	77.4
	somewhat disagree	8	6.5	6.5	83.9
	strongly agree	19	15.3	15.3	99.2
	strongly disagree	1	.8	.8	100.0
	Total	124	100.0	100.0	

Procedures developed at my institution/facility are sufficient to control potential outbreaks of MRSA.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	50	40.3	40.3	40.3
	disagree	11	8.9	8.9	49.2
	somewhat agree	36	29.0	29.0	78.2
	somewhat disagree	16	12.9	12.9	91.1
	strongly agree	7	5.6	5.6	96.8
	strongly disagree	4	3.2	3.2	100.0
	Total	124	100.0	100.0	

I feel there is a realistic threat of a potential MRSA outbreak at my facility.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	22	17.7	17.7	17.7
	disagree	18	14.5	14.5	32.3
	somewhat agree	46	37.1	37.1	69.4
	somewhat disagree	23	18.5	18.5	87.9
	strongly agree	11	8.9	8.9	96.8
	strongly disagree	4	3.2	3.2	100.0
	Total	124	100.0	100.0	

Prevention procedures are generally followed with reasonable attention to detail by all Athletic Training					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	75	60.5	60.5	60.5
	disagree	2	1.6	1.6	62.1

	somewhat agree	20	16.1	16.1	78.2
	somewhat disagree	3	2.4	2.4	80.6
	strongly agree	20	16.1	16.1	96.8
	strongly disagree	4	3.2	3.2	100.0
	Total	124	100.0	100.0	

I am aware of the official position statement on MRSA put forth from the NATA.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	63	50.8	50.8	50.8
	disagree	6	4.8	4.8	55.6
	somewhat agree	22	17.7	17.7	73.4
	somewhat disagree	10	8.1	8.1	81.5
	strongly agree	23	18.5	18.5	100.0
	Total	124	100.0	100.0	

I am familiar with the CDC's recommended guidelines for the prevention of MRSA infections.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	60	48.4	48.4	48.4
	disagree	5	4.0	4.0	52.4
	somewhat agree	18	14.5	14.5	66.9
	somewhat disagree	14	11.3	11.3	78.2
	strongly agree	27	21.8	21.8	100.0
	Total	124	100.0	100.0	

The official position statement on MRSA prevention form the NATA are readily available if/when I need					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	70	56.5	56.5	56.5
	disagree	1	.8	.8	57.3
	somewhat agree	24	19.4	19.4	76.6
	somewhat disagree	4	3.2	3.2	79.8
	strongly agree	25	20.2	20.2	100.0
	Total	124	100.0	100.0	

These recommendations are relevant to the athletic population I work with.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		1	.8	.8	.8
	agree	72	58.1	58.1	58.9
	disagree	1	.8	.8	59.7

	somewhat agree	24	19.4	19.4	79.0
	somewhat disagree	4	3.2	3.2	82.3
	strongly agree	22	17.7	17.7	100.0
	Total	124	100.0	100.0	

I feel that an official policy for the field of Athletic Training would be beneficial for reducing the risk of MRSA infections in the athletic population.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	54	43.5	43.5	43.5
	disagree	4	3.2	3.2	46.8
	somewhat agree	36	29.0	29.0	75.8
	somewhat disagree	12	9.7	9.7	85.5
	strongly agree	18	14.5	14.5	100.0
	Total	124	100.0	100.0	

If my staff follows the recommended procedures in my practice setting, it is likely that MRSA risk will					
		Frequency	Percent	Valid Percent	Cumulative
Valid		2	1.6	1.6	1.6
	agree	28	22.6	22.6	24.2
	disagree	25	20.2	20.2	44.4
	somewhat agree	32	25.8	25.8	70.2
	somewhat disagree	24	19.4	19.4	89.5
	strongly agree	13	10.5	10.5	100.0
	Total	124	100.0	100.0	

The costs of enacting MRSA prevention recommended procedures outweighs the benefits.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		2	1.6	1.6	1.6
	agree	9	7.3	7.3	8.9
	disagree	50	40.3	40.3	49.2
	somewhat agree	13	10.5	10.5	59.7
	somewhat disagree	29	23.4	23.4	83.1
	strongly agree	2	1.6	1.6	84.7
	strongly disagree	19	15.3	15.3	100.0
	Total	124	100.0	100.0	

I expect my staff to follow MSRA prevention recommendations.					
		Frequency	Percent	Valid Percent	Cumulative

Valid		1	.8	.8	.8
	agree	57	46.0	46.0	46.8
	disagree	2	1.6	1.6	48.4
	somewhat agree	15	12.1	12.1	60.5
	somewhat disagree	1	.8	.8	61.3
	strongly agree	48	38.7	38.7	100.0
	Total	124	100.0	100.0	

At my facility we have policies that may conflict with an official written MRSA prevention policy.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		2	1.6	1.6	1.6
	agree	2	1.6	1.6	3.2
	disagree	70	56.5	56.5	59.7
	somewhat agree	14	11.3	11.3	71.0
	somewhat disagree	27	21.8	21.8	92.7
	strongly disagree	9	7.3	7.3	100.0
	Total	124	100.0	100.0	

At my facility we have a written policy based on the NATA and CDC position statement on prevention of					
		Frequency	Percent	Valid Percent	Cumulative
Valid		2	1.6	1.6	1.6
	agree	22	17.7	17.7	19.4
	disagree	47	37.9	37.9	57.3
	somewhat agree	17	13.7	13.7	71.0
	somewhat disagree	12	9.7	9.7	80.6
	strongly agree	10	8.1	8.1	88.7
	strongly disagree	14	11.3	11.3	100.0
	Total	124	100.0	100.0	

Patient education is a primary concern to Athletic Trainers at my facility.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	55	44.4	44.4	44.4
	disagree	2	1.6	1.6	46.0
	somewhat agree	29	23.4	23.4	69.4
	somewhat disagree	6	4.8	4.8	74.2
	strongly agree	31	25.0	25.0	99.2
	strongly disagree	1	.8	.8	100.0
	Total	124	100.0	100.0	

I feel that patient education on precautions is vital to success of a MRSA prevention program policy.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		1	.8	.8	.8
	agree	49	39.5	39.5	40.3
	somewhat agree	11	8.9	8.9	49.2
	somewhat disagree	2	1.6	1.6	50.8
	strongly agree	61	49.2	49.2	100.0
	Total	124	100.0	100.0	

I feel that patient education is important but not a primary concern in preventing the transmission of					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	9	7.3	7.3	7.3
	disagree	42	33.9	33.9	41.1
	somewhat agree	21	16.9	16.9	58.1
	somewhat disagree	31	25.0	25.0	83.1
	strongly agree	2	1.6	1.6	84.7
	strongly disagree	19	15.3	15.3	100.0
	Total	124	100.0	100.0	

I feel that environmental decontamination is the most important aspect of preventing MRSA outbreaks.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	19	15.3	15.3	15.3
	disagree	18	14.5	14.5	29.8
	somewhat agree	46	37.1	37.1	66.9
	somewhat disagree	27	21.8	21.8	88.7
	strongly agree	8	6.5	6.5	95.2
	strongly disagree	6	4.8	4.8	100.0
	Total	124	100.0	100.0	

Patient Education materials are readily available through various methods.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		4	3.2	3.2	3.2
	audiovisual materials, direct instruction	1	.8	.8	4.0
	audiovisual materials, direct instruction,	1	.8	.8	4.8
	audiovisual materials, direct instruction,	2	1.6	1.6	6.5
	audiovisual materials, direct instruction,	1	.8	.8	7.3
	audiovisual materials, direct instruction,	1	.8	.8	8.1
	audiovisual materials, direct instruction,	1	.8	.8	8.9
	audiovisual materials, direct instruction,	1	.8	.8	9.7

	audiovisual materials, pamphlets	1	.8	.8	10.5
	audiovisual materials, pamphlets, computer	1	.8	.8	11.3
	audiovisual materials, pamphlets, direct	5	4.0	4.0	15.3
	audiovisual materials, pamphlets, direct	8	6.5	6.5	21.8
	audiovisual materials, pamphlets, direct	5	4.0	4.0	25.8
	audiovisual materials, pamphlets, direct	3	2.4	2.4	28.2
	audiovisual materials, pamphlets, direct	1	.8	.8	29.0
	audiovisual materials, pamphlets, direct	5	4.0	4.0	33.1
	audiovisual materials, pamphlets, direct	1	.8	.8	33.9
	audiovisual materials, pamphlets, physician	1	.8	.8	34.7
	audiovisual materials, pamphlets, team	1	.8	.8	35.5
	audiovisual materials, team education	1	.8	.8	36.3
	audiovisual materials, team education,	1	.8	.8	37.1
	computer based education	1	.8	.8	37.9
	direct instruction	6	4.8	4.8	42.7
	direct instruction, physician interaction	5	4.0	4.0	46.8
	direct instruction, team education	5	4.0	4.0	50.8
	direct instruction, team education,	1	.8	.8	51.6
	direct instruction, team education,	1	.8	.8	52.4
	direct instruction, team education,	3	2.4	2.4	54.8
	direct instruction, team education,	1	.8	.8	55.6
	direct instruction, team education, other:	1	.8	.8	56.5
	direct instruction, team education,	4	3.2	3.2	59.7
	direct instruction, team education,	1	.8	.8	60.5
	other: none	1	.8	.8	61.3
	other: posters	1	.8	.8	62.1
	pamphlets	1	.8	.8	62.9
	pamphlets, direct instruction	2	1.6	1.6	64.5
	pamphlets, direct instruction, department	1	.8	.8	65.3
	pamphlets, direct instruction, physician	3	2.4	2.4	67.7
	pamphlets, direct instruction, team	7	5.6	5.6	73.4
	pamphlets, direct instruction, team	5	4.0	4.0	77.4
	pamphlets, direct instruction, team	1	.8	.8	78.2
	pamphlets, direct instruction, team	5	4.0	4.0	82.3
	pamphlets, direct instruction, team	1	.8	.8	83.1
	pamphlets, direct instruction, team	1	.8	.8	83.9
	pamphlets, direct instruction, team	14	11.3	11.3	95.2
	pamphlets, direct instruction, team	1	.8	.8	96.0
	pamphlets, team education	1	.8	.8	96.8
	pamphlets, team education, department	1	.8	.8	97.6

	pamphlets, team education, other: posters	2	1.6	1.6	99.2
	team education	1	.8	.8	100.0
	Total	124	100.0	100.0	

I feel confident that the policies developed by my Athletic Department for recognition, treatment and					
		Frequency	Percent	Valid Percent	Cumulative
Valid		1	.8	.8	.8
	agree	48	38.7	38.7	39.5
	disagree	10	8.1	8.1	47.6
	neither agree or disagree	47	37.9	37.9	85.5
	strongly agree	13	10.5	10.5	96.0
	strongly disagree	5	4.0	4.0	100.0
	Total	124	100.0	100.0	

I feel the procedures developed to address MRSA prevention, recognition, and treatment at my institution					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	44	35.5	35.5	35.5
	disagree	34	27.4	27.4	62.9
	neither agree or disagree	32	25.8	25.8	88.7
	strongly agree	10	8.1	8.1	96.8
	strongly disagree	4	3.2	3.2	100.0
	Total	124	100.0	100.0	

I feel comfortable developing standard procedures for prevention of MRSA with the teams I am directly					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	76	61.3	61.3	61.3
	disagree	2	1.6	1.6	62.9
	neither agree or disagree	21	16.9	16.9	79.8
	strongly agree	25	20.2	20.2	100.0
	Total	124	100.0	100.0	

I feel I would benefit from additional education for MRSA prevention/awareness.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		1	.8	.8	.8
	agree	69	55.6	55.6	56.5
	disagree	10	8.1	8.1	64.5
	neither agree or disagree	31	25.0	25.0	89.5
	strongly agree	11	8.9	8.9	98.4

	strongly disagree	2	1.6	1.6	100.0
	Total	124	100.0	100.0	

I feel members of my Athletic Training Staff would benefit from MRSA education/training.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	71	57.3	57.3	57.3
	disagree	11	8.9	8.9	66.1
	neither agree or disagree	27	21.8	21.8	87.9
	strongly agree	15	12.1	12.1	100.0
	Total	124	100.0	100.0	

I feel I am given adequate opportunities to receive MRSA prevention and treatment training from my					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	43	34.7	34.7	34.7
	disagree	29	23.4	23.4	58.1
	neither agree or disagree	40	32.3	32.3	90.3
	strongly agree	9	7.3	7.3	97.6
	strongly disagree	3	2.4	2.4	100.0
	Total	124	100.0	100.0	

I feel I am given adequate opportunities for MRSA prevention training through the NATA.					
		Frequency	Percent	Valid Percent	Cumulative
Valid	agree	68	54.8	54.8	54.8
	disagree	8	6.5	6.5	61.3
	neither agree or disagree	41	33.1	33.1	94.4
	strongly agree	6	4.8	4.8	99.2
	strongly disagree	1	.8	.8	100.0
	Total	124	100.0	100.0	

I feel the NATA could take more initiative to increase awareness of the potential threat MRSA poses to the Athletic community.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		1	.8	.8	.8
	agree	34	27.4	27.4	28.2
	disagree	23	18.5	18.5	46.8
	neither agree or disagree	58	46.8	46.8	93.5
	strongly agree	7	5.6	5.6	99.2
	strongly disagree	1	.8	.8	100.0

I feel the NATA could take more initiative to increase awareness of the potential threat MRSA poses to the Athletic community.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		1	.8	.8	.8
	agree	34	27.4	27.4	28.2
	disagree	23	18.5	18.5	46.8
	neither agree or disagree	58	46.8	46.8	93.5
	strongly agree	7	5.6	5.6	99.2
	strongly disagree	1	.8	.8	100.0
	Total	124	100.0	100.0	

Professional development in MRSA prevention strategies would be most effective through the following methods.					
		Frequency	Percent	Valid Percent	Cumulative
Valid		1	.8	.8	.8
	Instruction from superiors.	9	7.3	7.3	8.1
	Journal of Athletic Training	25	20.2	20.2	28.2
	NATA News article	26	21.0	21.0	49.2
	National Convention	18	14.5	14.5	63.7
	other: all of the above/specific	1	.8	.8	64.5
	other: Workshops	1	.8	.8	65.3
	Web-Based education course	43	34.7	34.7	100.0
	Total	124	100.0	100.0	

Appendix B – Crosstabs of Division

Division * Practice guidelines for infection control are too prescriptive for Athletic Training.

Crosstab						
Count						
		Practice guidelines for infection control are too prescriptive for Athletic Training.				
		agree	disagree	somewhat	somewhat	strongly agree
Division		0	2	3	0	0
	Division I	2	18	2	6	0
	Division II	2	5	5	11	1
	Division III	1	23	8	25	0
	Total	5	48	18	42	1

Crosstab			
Count			
		Practice guidelines for infection control are too prescriptive for Athletic Training.	
		strongly disagree	Total
Division		0	5
	Division I	3	31
	Division	3	27
	Division	4	61
	Total	10	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	26.525a	15	.033
Likelihood Ratio	26.028	15	.038
N of Valid Cases	124		

Division * I feel practice guidelines are practical to use.

Crosstab					
Count					
		I feel practice guidelines are practical to use.			
		agree	disagree	somewhat agree	somewhat disagree
Division		1	0	2	1
	Division I	19	2	5	0
	Division II	11	0	13	1

	Division III	40	1	10	4
	Total	71	3	30	6

Crosstab			
Count			
		I feel practice guidelines are practical to use.	
		strongly agree	Total
Division		1	5
	Division I	5	31
	Division II	2	27
	Division III	6	61
	Total	14	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	21.395a	12	.045
Likelihood Ratio	21.159	12	.048
N of Valid Cases	124		
a. 13 cells (65.0%) have expected count less than 5. The minimum expected count is .12.			

Division * I feel that patient education on precautions is vital to success of a MRSA prevention program policy.

Crosstab					
Count					
		I feel that patient education on precautions is vital to success of a MRSA			
			agree	somewhat agree	somewhat
Division		1	3	1	0
	Division I	0	16	2	0
	Division II	0	10	3	0
	Division III	0	20	5	2
	Total	1	49	11	2

Crosstab			
Count			
		I feel that patient education on precautions is vital to success of a MRSA	
		strongly agree	Total
Division		0	5
	Division	13	31
	Division	14	27
	Division	34	61
	Total	61	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.734a	12	.001
Likelihood Ratio	18.277	12	.108
N of Valid Cases	124		
a. 13 cells (65.0%) have expected count less than 5. The minimum expected count is .04.			

Division * I feel that patient education is important but not a primary concern in preventing the transmission of MRSA in athletics.

Crosstab						
Count						
		I feel that patient education is important but not a primary concern in preventing				
		agree	disagree	somewhat	somewhat	strongly agree
Division		0	1	0	3	1
	Division I	2	12	7	6	0
	Division II	3	8	5	7	1
	Division III	4	21	9	15	0
	Total	9	42	21	31	2

Crosstab			
Count			
		I feel that patient education is important but not a primary concern in preventing	
		strongly disagree	Total
Division		0	5
	Division	4	31
	Division	3	27
	Division	12	61
	Total	19	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.778a	15	.144
Likelihood Ratio	15.991	15	.383
N of Valid Cases	124		
a. 15 cells (62.5%) have expected count less than 5. The minimum expected count is .08.			

Division * I feel the NATA could take more initiative to increase awareness of the potential threat MRSA poses to the Athletic community.

Crosstab
Count

		I feel the NATA could take more initiative to increase awareness of the potential				
			agree	disagree	neither agree or	strongly agree
Division		1	0	1	2	1
	Division I	0	7	8	16	0
	Division II	0	12	3	10	1
	Division III	0	15	11	30	5
	Total	1	34	23	58	7

Crosstab			
Count			
		I feel the NATA could take more initiative to increase awareness of the	
		strongly disagree	Total
Division		0	5
	Division I	0	31
	Division	1	27
	Division	0	61
	Total	1	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39.046a	15	.001
Likelihood Ratio	23.099	15	.082
N of Valid Cases	124		
a. 15 cells (62.5%) have expected count less than 5. The minimum expected count is .04.			

Appendix C – Crosstabs of Geographic location

State * Practice guidelines are difficult to apply and adapt to my specific practice.

Crosstab						
Count						
		Practice guidelines are difficult to apply and adapt to my specific practice.				
		agree	disagree	somewhat agree	somewhat disagree	strongly agree
State		0	1	1	0	0
	AK	0	1	0	0	0
	AL	0	2	0	1	0
	AR	0	2	0	0	0
	CT	0	0	3	1	0
	DC	0	1	0	0	0
	FL	1	2	3	2	0
	GA	0	3	0	1	0
	HI	0	0	1	0	0
	IA	0	1	0	0	0
	ID	0	0	0	1	0
	IL	0	2	0	1	0
	IN	0	1	0	0	0
	KS	0	0	1	0	0
	KY	0	4	0	0	0
	LA	0	0	0	0	1
	MA	0	2	1	2	2
	MD	0	5	1	1	0
	ME	1	1	0	1	0
	MI	0	1	0	0	0
	MN	0	1	1	0	0
	MO	0	1	0	0	0
	MT	1	0	0	0	0
	NC	0	0	0	2	0
	ND	0	1	0	0	0
	NH	0	2	0	1	0
	NM	0	1	0	0	0
	NY	0	6	1	3	0
	OH	0	9	0	1	0
	PA	0	4	2	5	0
	SC	0	0	1	0	0
	SD	0	1	0	0	0
	TN	0	4	0	1	0

	TX	0	2	1	0	0
	VA	0	3	1	0	1
	VT	0	1	0	0	0
	WI	0	0	0	0	0
	Total	3	65	18	24	4

Crosstab			
Count			
		Practice guidelines are difficult to apply and adapt to my specific practice.	
		strongly disagree	Total
State		0	2
	AK	0	1
	AL	1	4
	AR	0	2
	CT	0	4
	DC	0	1
	FL	0	8
	GA	0	4
	HI	0	1
	IA	0	1
	ID	0	1
	IL	2	5
	IN	0	1
	KS	0	1
	KY	1	5
	LA	0	1
	MA	0	7
	MD	1	8
	ME	1	4
	MI	0	1
	MN	0	2
	MO	0	1
	MT	0	1
	NC	0	2
	ND	0	1
	NH	0	3
	NM	0	1
	NY	1	11
	OH	1	11
	PA	1	12

	SC	0	1
	SD	0	1
	TN	0	5
	TX	0	3
	VA	0	5
	VT	0	1
	WI	1	1
	Total	10	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	213.504a	180	.044
Likelihood Ratio	135.996	180	.994
N of Valid Cases	124		
a. 219 cells (98.6%) have expected count less than 5. The minimum expected count is .02.			

State * Guidelines are difficult to apply to Athletic Training practice.

Crosstab						
Count						
		Guidelines are difficult to apply to Athletic Training practice.				
			agree	disagree	somewhat agree	somewhat disagree
State		0	0	1	0	1
	AK	0	0	1	0	0
	AL	0	0	2	0	1
	AR	0	0	1	0	0
	CT	0	1	0	3	0
	DC	0	0	0	0	0
	FL	0	0	3	2	3
	GA	0	0	3	1	0
	HI	0	0	0	1	0
	IA	0	0	1	0	0
	ID	0	0	0	0	1
	IL	1	0	2	0	0
	IN	0	0	1	0	0
	KS	0	0	0	1	0
	KY	0	0	5	0	0
	LA	0	1	0	0	0
	MA	0	1	2	2	2
	MD	0	0	5	0	2

	ME	0	0	3	0	0
	MI	0	0	0	1	0
	MN	0	0	1	1	0
	MO	0	0	1	0	0
	MT	0	0	0	1	0
	NC	0	0	0	1	0
	ND	0	0	1	0	0
	NH	0	0	2	1	0
	NM	0	0	1	0	0
	NY	0	0	6	0	4
	OH	0	0	8	0	2
	PA	0	0	4	0	5
	SC	0	0	0	0	1
	SD	0	0	0	0	0
	TN	0	0	4	0	1
	TX	0	0	1	1	0
	VA	0	0	3	2	0
	VT	0	0	1	0	0
	WI	0	0	0	0	0
	Total	1	3	63	18	23

Crosstab

Count

		Guidelines are difficult to apply to Athletic Training practice.	
		strongly disagree	Total
State		0	2
	AK	0	1
	AL	1	4
	AR	1	2
	CT	0	4
	DC	1	1
	FL	0	8
	GA	0	4
	HI	0	1
	IA	0	1
	ID	0	1
	IL	2	5
	IN	0	1
	KS	0	1
	KY	0	5
	LA	0	1

	MA	0	7
	MD	1	8
	ME	1	4
	MI	0	1
	MN	0	2
	MO	0	1
	MT	0	1
	NC	1	2
	ND	0	1
	NH	0	3
	NM	0	1
	NY	1	11
	OH	1	11
	PA	3	12
	SC	0	1
	SD	1	1
	TN	0	5
	TX	1	3
	VA	0	5
	VT	0	1
	WI	1	1
	Total	16	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	210.252a	180	.061
Likelihood Ratio	150.818	180	.945
N of Valid Cases	124		
a. 219 cells (98.6%) have expected count less than 5. The minimum expected count is .01.			

State * Prevention procedures are generally followed with reasonable attention to detail by all Athletic Training Staff members.

Crosstab						
Count						
		Prevention procedures are generally followed with reasonable attention to detail by all Athletic				
		agree	disagree	somewhat agree	somewhat	strongly agree
State		2	0	0	0	0
	AK	0	1	0	0	0
	AL	3	0	0	0	1

	AR	2	0	0	0	0
	CT	0	0	2	0	0
	DC	0	0	0	0	1
	FL	6	0	2	0	0
	GA	1	0	1	1	1
	HI	1	0	0	0	0
	IA	1	0	0	0	0
	ID	1	0	0	0	0
	IL	1	1	1	0	2
	IN	1	0	0	0	0
	KS	0	0	1	0	0
	KY	3	0	1	1	0
	LA	1	0	0	0	0
	MA	2	0	3	0	0
	MD	6	0	0	0	2
	ME	1	0	2	0	1
	MI	0	0	0	0	1
	MN	2	0	0	0	0
	MO	1	0	0	0	0
	MT	0	0	1	0	0
	NC	0	0	0	0	2
	ND	0	0	1	0	0
	NH	1	0	0	1	1
	NM	1	0	0	0	0
	NY	9	0	1	0	1
	OH	9	0	2	0	0
	PA	7	0	1	0	4
	SC	1	0	0	0	0
	SD	1	0	0	0	0
	TN	4	0	0	0	1
	TX	2	0	0	0	1
	VA	3	0	1	0	1
	VT	1	0	0	0	0
	WI	1	0	0	0	0
	Total	75	2	20	3	20

Crosstab			
Count			
		Prevention procedures are generally followed with reasonable attention to detail by all Athletic	
		strongly disagree	Total

State		0	2
	AK	0	1
	AL	0	4
	AR	0	2
	CT	2	4
	DC	0	1
	FL	0	8
	GA	0	4
	HI	0	1
	IA	0	1
	ID	0	1
	IL	0	5
	IN	0	1
	KS	0	1
	KY	0	5
	LA	0	1
	MA	2	7
	MD	0	8
	ME	0	4
	MI	0	1
	MN	0	2
	MO	0	1
	MT	0	1
	NC	0	2
	ND	0	1
	NH	0	3
	NM	0	1
	NY	0	11
	OH	0	11
	PA	0	12
	SC	0	1
	SD	0	1
	TN	0	5
	TX	0	3
	VA	0	5
	VT	0	1
	WI	0	1
	Total	4	124

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	229.029a	180	.008
Likelihood Ratio	132.459	180	.997
N of Valid Cases	124		
a. 219 cells (98.6%) have expected count less than 5. The minimum expected count is .02.			

Appendix D – Crosstabs of Clinical Work Percentage

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	38.023a	25	.046
Likelihood Ratio	40.938	25	.023
N of Valid Cases	124		
a. 26 cells (72.2%) have expected count less than 5. The minimum expected count is .01.			

Crosstab			
Count			
		Antimicrobial Resistance is a national problem	
		strongly agree	Total
Clinical Work %		0	1
	0%	1	18
	100%	14	49
	25%	3	5
	50%	12	16
	75%	12	35
	Total	42	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	43.904a	30	.049
Likelihood Ratio	39.259	30	.120
N of Valid Cases	124		
a. 32 cells (76.2%) have expected count less than 5. The minimum expected count is .01.			

Crosstab				
Count				
		There is a clear distinction between generalized antimicrobial resistance and MRSA.		
		strongly agree	strongly disagree	Total
Clinical Work %		0	0	1
	0%	0	1	18
	100%	0	0	49
	25%	0	0	5
	50%	3	0	16
	75%	0	0	35
	Total	3	1	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)

Pearson Chi-Square	44.065a	30	.047
Likelihood Ratio	30.863	30	.422
N of Valid Cases	124		
a. 33 cells (78.6%) have expected count less than 5. The minimum expected count is .01.			

Crosstab				
Count				
		I am at risk for getting a MRSA infection as a healthcare worker.		
		strongly agree	strongly disagree	Total
Clinical Work %		0	0	1
	0%	3	0	18
	100%	1	1	49
	25%	1	0	5
	50%	2	0	16
	75%	3	1	35
	Total	10	2	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	37.528a	25	.051
Likelihood Ratio	33.235	25	.125
N of Valid Cases	124		
a. 28 cells (77.8%) have expected count less than 5. The minimum expected count is .01.			

Crosstab			
Count			
		Patient education is a primary concern to Athletic Trainers at my facility.	
		strongly disagree	Total
Clinical Work %		0	1
	0%	0	18
	100%	0	49
	25%	0	5
	50%	0	16
	75%	1	35
	Total	1	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.137a	25	.028
Likelihood Ratio	43.072	25	.014
N of Valid Cases	124		
a. 26 cells (72.2%) have expected count less than 5. The minimum expected count is .05.			

Crosstab				
Count				
		I feel that environmental decontamination is the most important aspect of preventing MRSA outbreaks.		
		strongly agree	strongly disagree	Total
Clinical Work %		0	0	1
	0%	3	0	18
	100%	0	5	49
	25%	1	0	5
	50%	1	0	16
	75%	3	1	35
	Total	8	6	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	50.550a	35	.043
Likelihood Ratio	36.820	35	.385
N of Valid Cases	124		
a. 38 cells (79.2%) have expected count less than 5. The minimum expected count is .01.			

Crosstab					
Count					
		Professional development in MRSA prevention strategies would be most effective through the following methods.			
		other: all of the above/specific ceu courses	other: Workshops	Web-Based education course	Total
Clinical Work %		0	0	1	1
	0%	0	0	6	18
	100%	0	1	14	49
	25%	1	0	2	5
	50%	0	0	8	16
	75%	0	0	12	35
	Total	1	1	43	124

Appendix E – Crosstabs of Experience

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	290.149a	192	.000
Likelihood Ratio	136.608	192	.999
N of Valid Cases	124		
a. 231 cells (100.0%) have expected count less than 5. The minimum expected count is .01.			

Crosstab				
Count				
		Athletes at my facility are generally aware of practice guidelines related to their specific conditions.		
		strongly agree	strongly disagree	Total
Experience		0	0	4
	09	0	0	1
	1	0	0	1
	10	1	0	7
	11	0	0	6
	12	0	0	1
	13	0	0	3
	14	0	0	6
	15	0	0	6
	16	0	1	3
	17	0	0	1
	18	0	0	3
	19	0	0	2
	2	0	0	5
	20	0	0	6
	22	0	0	1
	23	0	0	2
	24	0	1	3
	25	0	0	1
	26	0	0	1
	28	2	0	4
	3	0	0	11
	3.5	0	0	1
	31	0	0	1
	33	0	0	1
	4	1	0	8
	4.5	0	0	1
	40	0	0	2

	5	3	0	11
	5 months	0	0	1
	6	0	0	7
	8	0	0	5
	9	0	0	8
	Total	7	2	124

Appendix F – Crosstabs of Gender

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	8.676a	3	.034
Likelihood Ratio	9.413	3	.024
N of Valid Cases	124		
a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is .87.			

Crosstab						
Count						
		I feel comfortable developing standard procedures for prevention of MRSA with the teams I am directly responsible for.				
		agree	disagree	neither agree or disagree	strongly agree	Total
Gender	Female	28	2	14	10	54
	Male	48	0	7	15	70
	Total	76	2	21	25	124

Appendix G – Crosstabs of Experience with MRSA

Chi-Square Tests			
	Value	df	Asymp.
Pearson Chi-Square	22.970a	12	.028
Likelihood Ratio	13.061	12	.365
N of Valid Cases	124		
a. 16 cells (80.0%) have expected count less than 5. The minimum expected count is .03.			

Crosstab				
Count				
		I do not feel that I have time to stay informed about practice guidelines for		
		somewhat disagree	strongly disagree	Total
Experience with MRSA		0	0	2
	No	0	1	10
	Unsure	0	0	4
	Yes	24	16	108
	Total	24	17	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	22.970a	12	.028
Likelihood Ratio	13.061	12	.365
N of Valid Cases	124		
a. 16 cells (80.0%) have expected count less than 5. The minimum expected count is .03.			

Crosstab			
Count			
		I prefer to work without protocols and guidelines because they are	
		strongly disagree	Total
Experience with MRSA		0	2
	No	2	10
	Unsure	1	4
	Yes	37	108
	Total	40	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)

Pearson Chi-Square	50.513a	12	.000
Likelihood Ratio	25.904	12	.011
N of Valid Cases	124		
a. 15 cells (75.0%) have expected count less than 5. The minimum expected count is .05.			

Crosstab			
Count			
		I feel practice guidelines are practical to use.	
		strongly agree	Total
Experience with MRSA		0	2
	No	0	10
	Unsure	0	4
	Yes	14	108
	Total	14	124

Crosstab			
Count			
		Guidelines are difficult to apply to Athletic Training practice.	
		strongly disagree	Total
Experience with MRSA		0	2
	No	2	10
	Unsure	0	4
	Yes	14	108
	Total	16	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	47.310a	15	.000
Likelihood Ratio	22.722	15	.090
N of Valid Cases	124		
a. 19 cells (79.2%) have expected count less than 5. The minimum expected count is .02.			

Crosstab					
Count					
		Athletes at my facility are generally aware of practice guidelines related to their			
		somewhat disagree	strongly agree	strongly disagree	Total
Experience with MRSA		0	0	1	2
	No	0	0	0	10
	Unsure	1	0	0	4

	Yes	13	7	1	108
	Total	14	7	2	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	39.460a	18	.002
Likelihood Ratio	17.720	18	.474
N of Valid Cases	124		
a. 23 cells (82.1%) have expected count less than 5. The minimum expected count is .02.			

Crosstab				
Count				
		Antimicrobial Resistance is a problem at my facility.		
		strongly agree	strongly disagree	Total
Experience with MRSA		0	0	2
	No	0	3	10
	Unsure	0	0	4
	Yes	4	6	108
	Total	4	9	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.099a	15	.012
Likelihood Ratio	31.786	15	.007
N of Valid Cases	124		
a. 19 cells (79.2%) have expected count less than 5. The minimum expected count is .06.			

Crosstab				
Count				
		There is a clear distinction between generalized antimicrobial resistance and		
		strongly agree	strongly disagree	Total
Experience with MRSA		0	0	2
	No	0	0	10
	Unsure	0	0	4
	Yes	3	1	108
	Total	3	1	124

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	40.965a	18	.002
Likelihood Ratio	22.182	18	.224
N of Valid Cases	124		
a. 24 cells (85.7%) have expected count less than 5. The minimum expected count is .02.			

Crosstab				
Count				
		Procedures developed at my institution/facility are sufficient to control		
		strongly agree	strongly disagree	Total
Experience with MRSA		0	1	2
	No	0	0	10
	Unsure	0	0	4
	Yes	7	3	108
	Total	7	4	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.418a	15	.045
Likelihood Ratio	16.431	15	.354
N of Valid Cases	124		
a. 19 cells (79.2%) have expected count less than 5. The minimum expected count is .06.			

Crosstab				
Count				
		Prevention procedures are generally followed with reasonable attention to detail		
		strongly agree	strongly disagree	Total
Experience with MRSA		0	1	2
	No	0	0	10
	Unsure	0	0	4
	Yes	20	3	108
	Total	20	4	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	32.760a	15	.005
Likelihood Ratio	22.723	15	.090
N of Valid Cases	124		
a. 20 cells (83.3%) have expected count less than 5. The minimum expected count is .03.			

Crosstab			
Count			
		I am aware of the official position statement on MRSA put forth from the	
		strongly agree	Total
Experience with MRSA		0	2
	No	1	10
	Unsure	0	4
	Yes	22	108
	Total	23	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	25.995a	12	.011
Likelihood Ratio	17.419	12	.135
N of Valid Cases	124		
a. 14 cells (70.0%) have expected count less than 5. The minimum expected count is .10.			

Crosstab				
Count				
		At my facility we have policies that may conflict with an official written MRSA		
		somewhat disagree	strongly disagree	Total
Experience with MRSA		0	0	2
	No	3	0	10
	Unsure	2	0	4
	Yes	22	9	108
	Total	27	9	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27.730a	15	.023
Likelihood Ratio	19.068	15	.211
N of Valid Cases	124		
a. 19 cells (79.2%) have expected count less than 5. The minimum expected count is .03.			

Crosstab			
Count			
		I feel confident that the policies developed by my Athletic Department for	

		strongly agree	strongly disagree	Total
Experience with MRSA		0	1	2
	No	0	1	10
	Unsure	0	0	4
	Yes	13	3	108
	Total	13	5	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	28.546a	15	.018
Likelihood Ratio	17.469	15	.292
N of Valid Cases	124		
a. 20 cells (83.3%) have expected count less than 5. The minimum expected count is .02.			

Crosstab			
Count			
		I feel the procedures developed to address MRSA prevention, recognition, and	
		strongly disagree	Total
Experience with MRSA		0	2
	No	0	10
	Unsure	0	4
	Yes	4	108
	Total	4	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.025a	12	.115
Likelihood Ratio	17.876	12	.120
N of Valid Cases	124		
a. 16 cells (80.0%) have expected count less than 5. The minimum expected count is .06.			

Crosstab				
Count				
		I feel the NATA could take more initiative to increase awareness of the potential		
		strongly agree	strongly disagree	Total
Experience with MRSA		0	0	2
	No	1	0	10
	Unsure	0	0	4
	Yes	6	1	108

Crosstab				
Count				
		I feel the NATA could take more initiative to increase awareness of the potential		
		strongly agree	strongly disagree	Total
Experience with MRSA		0	0	2
	No	1	0	10
	Unsure	0	0	4
	Yes	6	1	108
	Total	7	1	124

Appendix H – Crosstabs of Sport Coverage

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	43.831a	15	.000
Likelihood Ratio	23.240	15	.079
N of Valid Cases	124		
a. 20 cells (83.3%) have expected count less than 5. The minimum expected count is .02.			

Crosstab				
Count				
		In my practice setting, there is sufficient administrative support and resources to allow the implementation of practice guidelines.		
		strongly agree	strongly disagree	Total
# of Sports		0	0	1
	1	0	0	9
	2	2	0	19
	3	0	0	16
	more than 3	7	5	79
	Total	9	5	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	34.140a	20	.025
Likelihood Ratio	36.366	20	.014
N of Valid Cases	124		
a. 23 cells (76.7%) have expected count less than 5. The minimum expected count is .04.			

Crosstab				
Count				
		Athletes at my facility are generally aware of practice guidelines related to their specific conditions.		
		strongly agree	strongly disagree	Total
# of Sports		0	1	1
	1	0	0	9
	2	1	0	19
	3	0	0	16
	more than 3	6	1	79
	Total	7	2	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	83.355a	24	.000

Likelihood Ratio	25.528	24	.378
N of Valid Cases	124		
a. 28 cells (80.0%) have expected count less than 5. The minimum expected count is .01.			

Crosstab			
Count			
		Antimicrobial Resistance is a problem at my facility.	
		strongly disagree	Total
# of Sports		0	1
	1	0	9
	2	0	19
	3	0	16
	more than 3	9	79
	Total	9	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	33.357a	20	.031
Likelihood Ratio	27.195	20	.130
N of Valid Cases	124		
a. 23 cells (76.7%) have expected count less than 5. The minimum expected count is .03.			

Crosstab				
Count				
		There is a clear distinction between generalized antimicrobial resistance and MRSA.		
		strongly agree	strongly disagree	Total
# of Sports		0	1	1
	1	0	0	9
	2	0	0	19
	3	0	0	16
	more than 3	3	0	79
	Total	3	1	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	138.046a	24	.000
Likelihood Ratio	26.189	24	.344
N of Valid Cases	124		
a. 29 cells (82.9%) have expected count less than 5. The minimum expected count is .01.			

Crosstab		
Count		
		I feel that an official policy for the field of Athletic Training would be beneficial for reducing the risk of MRSA infections in the athletic population.

		strongly agree	Total
# of Sports		0	1
	1	0	9
	2	2	19
	3	2	16
	more than 3	14	79
	Total	18	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	29.661a	16	.020
Likelihood Ratio	27.383	16	.037
N of Valid Cases	124		
a. 18 cells (72.0%) have expected count less than 5. The minimum expected count is .03.			

Crosstab					
Count					
		At my facility we have a written policy based on the NATA and CDC position statement on prevention of MRSA infections.			
		somewhat disagree	strongly agree	strongly disagree	Total
# of Sports		0	0	0	1
	1	0	0	1	9
	2	2	2	2	19
	3	1	1	1	16
	more than 3	9	7	10	79
	Total	12	10	14	124

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	75.134a	24	.000
Likelihood Ratio	23.325	24	.501
N of Valid Cases	124		
a. 27 cells (77.1%) have expected count less than 5. The minimum expected count is .02.			

Crosstab				
Count				
		I feel that patient education is important but not a primary concern in preventing the transmission of MRSA in athletics.		
		strongly agree	strongly disagree	Total
# of		0	1	1
	1	0	1	9
	2	1	1	19

	3	0	0	16
	more than 3	1	16	79
	Total	2	19	124