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# Comparison of Awareness of Exertional Heatstroke among Certified Athletic Trainers and Emergency Medical Services Providers

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## INTRODUCTION

Exertional Heat Stroke is a medical emergency that requires first responders to efficiently work together in order to optimize patient outcome. Exertional heat stroke recognition, treatment, and awareness are extremely vital for emergency health care providers to comprehend. Current research shows a 100% survival rate with the CWI technique if done immediately after recognition of EHS.<sup>1-3</sup> Due to the importance of cooling as soon as possible after recognition of EHS, athletic trainers and EMS providers must work together as an efficient team in the emergency medical care of EHS. In order to provide the most effective care, a common awareness of EHS needs to be established among ATs and EMS providers.

In athletic emergencies, the interaction among ATs and EMS is essential in order to provide the best level of care. Differences exist in protocol and standing orders among these health care providers that each must follow. Timely diagnosis and treatment are essential in prognosis outcome to the patient.<sup>4-7</sup>

## PURPOSE

The purpose of the study was to assess the knowledge of EHS recognition and treatment in ATs, paramedics, emergency medical technicians, and emergency medical responders, in order to then compare and contrast the themes among the various occupations.

## METHODS

Research Design: This study used a qualitative method approach to develop key themes among all involved health care providers. The responses from the online surveys were analyzed for common themes.

Inclusion Criteria: (1) Connecticut licensed and certified AT and (2) currently practicing as an AT, or (1) Connecticut licensed and certified EMS provider (paramedic, AEMT, EMT, or EMR) and (2) currently practicing as that provider. Exclusion Criteria: (1) participants who qualified to be both ATs and EMS providers.

Participants: Ninety questionnaires were opened (68 EMS surveys and 22 AT surveys), while only 35 were completed (26 EMS and nine AT surveys). These 35 valid responses yielded a 38.9% response rate.

Data Collection: Each participant completed the 24-question survey online via SurveyMonkey®. The Department of Public Health was contacted for the list of EMS directors and the EMS directors of each region were asked to send the survey link out to all EMS providers in their region. All participants signed an electronic Informed Consent Form attached to the survey and approved by the University's IRB. All answers remained completely anonymous. The survey questions were taken from studies from Applegate<sup>8</sup> and Mazerolle<sup>9</sup> which were previously validated. The survey was open for a month and a half.

Category	Description
EHS clinical findings	The clinical findings used to identify EHS, such as sweat, skin condition; heart rate; and mental status, and the importance of these clinical findings.
Treatment	The different clinical methods for treating a patient with EHS. Treatments include cooling methods, immediate transport, and ALS intervention.
Cooling Methods	Various methods used to cool the patient, such as ice packs, clothing removal, ice baths, IV fluids, and wet towels.
Concerns and comfort levels with dealing with EHS	How comfortable a health care provider is with dealing with EHS and the concerns that may arise with evaluating and treating patient. Concern and comfort level can be influenced by education, experience, and exposure.
Perception	What ATCs think of EMS providers and what EMS providers think of ATCs. What each provider thinks of the role and responsibilities of the other. Assumptions each provider has about the other. Perception of treatment methods. Perception of scope of practice of each provider.
EMS & ATC relationship	Relationship between EMS providers and ATCs: communication, respect, authority, protocol differences, scope of practice, job differences, recommendations.
Education	Level of education provided dealing with EHS. Is EHS discussed in their protocol or not.

Data Analysis and Credibility: Themes were created using the grounded theory method and general inductive analysis.<sup>10,11</sup> General codes were established after comparing question responses. Codes were organized into categories and the categories were used to develop two final themes. The procedures and data were reviewed for validity and consistency by a multiple-analyst triangulation method and peer review.

## RESULTS

THM1. Proper education is the basis for clinician comfort and quality patient care		THM2. Improved scope of practice comprehension among ATs and EMS providers will create better interpersonal interaction and will optimize patient care.
(PTN1.) Education influences the diagnosis and treatment of EHS	(PTN2.) Concerns and comfort level dealing with EHS vary among providers.	(PTN3.) The interprofessional perceptions among ATs and EMS providers influences their interactions,
(PTN1a.) The signs and symptoms used to diagnosis EHS are directly related to the provider's education	(PTN2a.) Availability of resources is a concern for medical providers in dealing with EHS	(PTN3a.) A better understanding of protocols and scope of practice among ATs and EMS providers will help them work together and provide optimal patient care
	(PTN2b.) Prior experience influences a medical provider's comfort level in dealing with an EHS	(PTN3b.) Improved communication among providers will increase patient care efficiency
(PTN1b.) Cooling methods and treatment between ATs and EMS providers differ based on provided education	(PTN2c.) Complications due to cooling and secondary pathologies create concerns with management of EHS	(PTN3c.) Respect and level of authority play a major role in the quality of on-scene treatment.

## DISCUSSION

A quality interaction among ATs and EMS providers is vital in order to help provide the best possible care to an EHS patient.

A previous study by Mazerolle et al.<sup>12</sup> showed how perception of other health care providers is heavily influenced on the knowledge of their skill set and roles. In another previous study, Applegate<sup>8</sup> observed that educational preparation for EMS providers emerged as the predominant explanation for their lack of evidence based practice regarding EHS. There was only one study by Mazerolle et al.<sup>12</sup> which asked EMS providers how to improve the EMS and AT relationship. The common theme established in this study was communication.<sup>12</sup> The EMS providers stated that there was a lack of understanding of the EMS provider's role in the EAP, as well as lack of understanding of an AT's knowledge and skill set.<sup>12</sup>

Common knowledge and treatment protocols between the two professions will help create a more effective and positive interpersonal relationship. Universal understanding of EHS recognition, diagnosis, and treatment will allow for both EMS and ATs to trust each other, leading to optimal patient care.

The findings from this study suggest to improve: patient care among providers, education on EHS pathology, and education on roles of each professional. A possible suggestion this study concludes is creating a universal protocol for all emergency medical health professionals. For optimal patient care, there should be fluidity in care from on-scene to the hospital. If a universal protocol exists, specific guidelines could be assigned to each profession based off their scope of practice.

Another possible implication that could improve interprofessional collaboration is workshops/CEU courses involving interprofessional interaction. For an example, ATs can provide a workshop on how EMS providers can assist ATs on scene with CWI, and in exchange, EMS personnel can provide a workshop on how to deal with aggressive/combatative patients.

In regards to specific interventions that can be implemented within the AT setting, a possible suggestion is creating a position statement on how to optimize interactions with EMS providers. An intervention specific to EMS providers is an additional chapter to their curriculum dedicated to athletic conditions.

The biggest limitations in this study were survey distribution and participation. Emails were sent out to all EMS directors in regions 1 and 2 of CT, however, there was no direct way to ensure these directors sent out the email to their EMS providers. A list of CT ATs was also not obtainable in our time period, but the email was sent out to local ATs via an athletic training clinical coordinator. This survey was also limited in that it only surveyed ATs and EMS providers practicing in CT.

Further research should be conducted on the EMS provider and AT's relationship. Interactions with other medical emergencies should also be investigated to see how interprofessional collaboration can be optimized.

Theme	Quote
THM1. Proper education is the basis for clinician comfort and quality patient care	EMS Participant: "I am minimally comfortable in treating EHS)...When I took my EMT course originally - it was barely covered at all."  EMS Participant: "I am trained in all types of environmental conditions and (am) as comfortable with my skills in any such situation (EHS treatment)." AT Participant: "(I am) fairly comfortable (in treating EHS)...During school, EHS wasn't as big of a deal as it is now. Since graduating I have gone to classes and seminars on diagnosis and treatment."
THM2. Improved scope of practice comprehension among ATs and EMS providers will create better interpersonal interaction and will optimize patient care.	EMS Participant: "I think many see the athletic trainer as "less than capable" and this is basically due to a lack of understanding the role of an athletic trainer. If EMS were properly trained to what an athletic trainer does and is capable of, and visa versa, there would be much greater respect and use of the ATs." EMS Participant: "Training both roles in the importance, capabilities and necessities of the other, they can work seamlessly. There must be mutual respect and understanding...This will allow EMS crews to more appropriately cover their respective areas and increase availability of EMS resources." AT Participant: "Monitor together and have plan for when the athlete is ready to be transferred (decide whether fluids are needed via IV, etc)...Understand each other's jobs and they training they have."

## CONCLUSION

Athletic Trainers' and EMS providers' survey responses generally followed their protocols and state practice acts. Theme one included a comprehension of aspects of education, EHS findings, treatment, and cooling methods. Theme two was based off perception and the relationship between ATs and EMS providers. The results of this study can help guide combined educational sessions for ATs and EMS providers. Future research focusing on the AT-EMS provider relationship can help increase productivity and optimal patient outcome when ATs and EMS providers work together in emergency situations.

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