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Athletic Trainers Leading the Charge for Change-An Example of Those Who Inspire Me

Douglas J. Casa, Ph.D., ATC, FNAK, FACSM, FNATA
CEO, Korey Stringer Institute

The ultimate legacy of a person is in the positive innovation of the quest they pursued. Those with forward thinking, are able to find solutions and are not limited by the constraints of a system that has limited nearly all of those that have preceded them, are the mark of those who will be remembered. The athletic trainers I describe below are some of my personal heroes. They are the Sunday phone calls and away-on-vacation text messages that are worth every second of the interruption, because the messages are full of hope, creativity, good news, and inspiration. These individuals have committed their lives to place athletic trainers in a position to advocate for enhancing health and safety policies at all levels of sport. As you read the stories, some of people you may know and some you don’t, please let this be a reminder that we can all take the lead to forge a path that is brand new and massively better than the path we have followed before.

David Csillan
Hall of Fame athletic trainer David Csillan would be the likeness I would use if we created a statue for an award to give for the most outstanding “I am going to get this done, and I am going to take the lead to make it happen” person. David spearheaded the original 2009 NATA position statement on heat acclimatization by mobilizing a team to take action back in 2006. He has rested for only a few days since then, David has also worked diligently to help take New Jersey to the lead spot in our KSI evaluation of state high school health and safety policies.

Lisa Walker
When Lisa wakes in the morning, she is thinking about what she can do to make the world a better place on that day. Her relationship with the Utah State High School Athletic Association as a representative of the sports medicine advisory committee is the ultimate model of how these organizations can work together in harmony to enhance health and safety for the athletes they serve.

Rebecca Lopez
Rebecca’s work in the Tampa community has shown how one really smart and respected person can build progress at the grassroots level. Her efforts with WetBulb Globe Temperature (WBGT), cold water immersion, rectal temperatures, pre-hospital care of exertional heat stroke, among many other items, have been instrumental in demonstrating how other content experts can become beacons for change in their community and region.

Mike Carroll
Could you imagine being an athletic trainer back in 2011 in the state of Texas and walking into a room and saying, “We are going to do away with 2-a-day football practices in the first week of preseason?” If you can accomplish such a feat, then you can do just about anything. I still remember the call from Mike when he informed me that Texas had voted to make substantial changes to their heat acclimatization policies. I told him that his leadership in Texas just made it massively easier to pass policies elsewhere. If TEXAS HIGH SCHOOL FOOTBALL did it, then I am sure every state can.

Jason Cates
Too many Jason Cates moments exist to even focus my attention on one. He is a non-stop bundle of energy, ideas, and forward momentum. He has been involved with change in Arkansas for the past decade, and his recent work with WBGT policies shows his abilities to build on existing relationships to continue to build toward greater changes.
Dan Newman
When the state of Oklahoma needed to make changes to enhance health and safety standards for high school sports, they turned to Dan to take the lead with this process. While Oklahoma is in the early stages of making changes, you know they are in good hands with Dan helping to steer the ship.

Jennifer Rheeling and Tina Carrillo
Sometimes charm and intelligence, grit and purpose, all come together to make for progress that can help many. In this case, it is two athletic trainers who recognized a need in D.C. and acted upon their desires to see change happen. When I watch them in action, I smile and feel fortunate for the job I am very lucky to have and the great things we get to do.

Christina Emrich
Every great leader needs an amazing sidekick, and Christina has been that in New Jersey with David Csillan. Christina is a no-nonsense, let’s-get-this-sh--done kind of person that every state meeting, serious about making policy changes, needs to make sure action is the end result. New Jersey recently made a change that would make them the first state to pass 80% for our independent evaluation of state health and safety policies, and Christina, and the NJSIAA SMAC, and the impressive executive director, Larry White, deserve a good share of the credit with making this happen.

Bud Cooper/Mike Ferrara/Ron Courson
When the state of Georgia needed to make amends for a horrendous state law regarding heat index and modifications to practice, these three incredible athletic trainers worked with the very impressive state high school athletic association director, Ralph Swearingen, and the legendary climatologist, Andrew Grundstein, to forge a path that led to the country’s best WBGT heat safety policies. The journey that led them to these massively helpful policies were the conduit to other states invoking similar changes. While being one of the first is the most difficult, they found a way to make it happen.

Yuri Hosokawa
If you know Yuri, I would not need to write anything to describe her, but for those that do not, let me just say that she combines a work ethic and brilliance that few have ever exhibited before. Her current work in Japan to get an entire country up to speed with best practices for the prevention, recognition, and treatment of exertional heat stroke will be a journey of many miles. But those who know Yuri, know to bet that she will succeed, because she knows no other outcome. When she interviewed with me for her PhD and showed me her Japanese translation of the NATA 2012 position statement on preventing sudden death in sport while sitting in my office during our very first meeting, I knew instantly we would get along really well.

Chris Troyanos
Where do I start? I could write forever, but I think one of the biggest legacy items for Chris will be his leadership to form the International Institute for Race Medicine (IIRM). This is a world-wide organization that is working to enhance medical care at running races wherever they take place. His recent collaboration with the IAAF shows this organization is going to have a big influence for change.

Robert Sefcik
Have you seen what he is doing in Florida? Basically, his philosophy is, “I will rest when the work is done,” and he has yet to rest. He has been a key leader in Florida with enhancing health and safety policies for high school sport and has been amazing with organizing three state policy meetings. He is never afraid to throw the apple cart across the room if it means he can help save a couple extra kids from needlessly dying.

"They are the Sunday phone calls and away-on-vacation text messages that are worth every second of the interruption, because the messages are full of hope, creativity, good news, and inspiration."
OUR MISSION AND ENDEAVORS COULD NOT HAVE BEEN MADE POSSIBLE WITHOUT OUR CORPORATE PARTNERS. WE ARE GREATLY APPRECIATIVE OF YOUR CONTINUED SUPPORT.

National Football League: The National Football League is a founding partner of the Korey Stringer Institute. The NFL supports multiple player safety initiatives for athletes of all levels. For more information on the NFL’s Health and Safety Initiatives, visit NFL Evolution.

Gatorade: Gatorade is a founding partner of the Korey Stringer Institute. Gatorade and the Gatorade Sport Science Institute continue to search for and study new and innovative ways to help athletes improve performance by facilitating proper hydration and nutrition.

National Athletic Trainers’ Association: The National Athletic Trainers’ Association is the professional membership association for certified athletic trainers and others who support the athletic training profession. Its mission is to engage and foster the continued growth and development of the athletic training profession and athletic trainers as unique health care providers.

University of Connecticut: The Korey Stringer Institute is housed at the University of Connecticut. The Department of Kinesiology faculty are renowned for their research and expertise in the areas of heat and hydration, injury prevention, and strength and conditioning.

Camelbak: The mission of Camelbak is to continuously reinvent and forever change the way people hydrate and perform. Visit Hydrated for useful resources on hydration practice.

Kestrel Pocket Weather Meters by Nielsen-Kellerman: Nielsen-Kellerman is committed to ensuring that people know the weather and environmental conditions that impact their health, safety, and bottom line. NK’s Kestrel meters are rugged, accurate, fully calibrated, portable, affordable and easy to use. KSI uses these wet bulb globe temperature thermometers to determine environmental conditions during research studies both inside the heat chamber and in field studies. Visit heatsstress.com for resources on physical activity in heat stress.

Mission: Mission has a dual mission. While delivering world-class innovations that meet the unique needs of an athletic lifestyle, Mission also makes an impact off the field of play through the M Foundation, which promotes the health and safety of youth athletes, and simultaneously recognizes and awards high school athletes that give back to their community.

Heartsmart.com: HeartSmart.com is a leading provider of Automated External Defibrillators, also referred to as AEDs. HeartSmart.com offers AED program to support AED owners with essential services, support, product maintenance, and training.

Eagle Pharmaceuticals: Eagle Pharmaceuticals is a specialty pharmaceutical company focused on developing injectable products, primarily in the areas of critical care, orphan diseases, and oncology. Its goal is to provide safer and more convenient solutions for patients and health care professionals with optimized formulations.
OUR MISSION

The mission of the Korey Stringer Institute is to provide research, education, advocacy, and consultation to maximize performance, optimize safety and prevent sudden death for the athlete, warfighter, and laborer.

KOREY’S STORY

In August 2001, Korey Stringer, a Minnesota Vikings offensive lineman, passed away from exertional heat stroke. Since the time of Korey’s death, his widow, Kelci, and his agent, James Gould, worked tirelessly to develop an institute to honor her husband’s legacy. Together with Douglas Casa from the Department of Kinesiology at the University of Connecticut, the Korey Stringer Institute was founded in April 2010.

ABOUT KSI

Advocacy and Policy Changes
KSI works with sport organizations, state medical boards, and national legislative bodies to campaign for the creation or improvement of existing policies as they relate to the prevention of sudden death in sport and physical activity.

Research
Our research ranges from basic to applied science, clinical, and education sciences. The new state-of-the-art Mission Heat Lab at UConn’s Korey Stringer Institute houses an environmental chamber that allows us to investigate the influence of heat on exercising individuals. We also conduct field research studies working with athletes, warfighters, and laborers.

Education
We offer an extremely comprehensive database of information related to health and safety issues as well as off- and on-site seminars.

Athlete and Heat Tolerance Testing
KSI specializes in the development of optimal hydration plans, electrolyte evaluation and replacement, nutritional evaluation, and performance testing to optimize athletic performance. KSI also specializes in helping athletes, warfighters, and laborers recover and return to physical activity following an exertional heat stroke.

Consultation
KSI helps institutions, sports leagues, and military branches improve their safety polices for the physically active at all levels.

Mass-Media Outreach
We inform the public on ways to keep all athletes, warfighters, and laborers safe in sport through multiple channels including traditional media, public services announcements, webinars, podcasts, conferences, talk shows, and social media.

LEARN MORE AT KSI.UCONN.EDU
Could you tell us about yourself?

I am married, I have 3 adult children and several grandchildren. I graduated from Brigham Young University in 1993 with my degree in Athletic Training. I worked in a Physical Therapy Clinic and at Springville High School in Springville, UT for my first 8 years of AT practice and then transitioned into the high school classroom leaving behind the PT Clinic. I enjoyed my time spent working in the clinic but my heart and my passion was for the high school student/athlete. I have spent my entire career at Springville High School and feel very blessed with the support of the community, coaches, parents, athletes and administration. My network of Physicians and other Allied Health Care Providers is 2nd to none. I feel that we truly have a team approach when educating and caring for the student athletes.

I have served the AT profession in several ways. I have held positions in AT leadership at the state, serving as Secretary, Treasurer and President of the Utah Athletic Trainers’ Association. At the district level, I have served as the Utah Rep to the BOD as well as President of District 7. I have served the NATA on the Honors and Awards Committee and the Secondary Schools committee. I continue to serve on the UATA BOD and am actively involved with my State Activities Association as well as State legislative activities. I have worked closely with not only KSI but with Gatorade and Cramer as well.

Could you tell us about your first involvement/interaction with the Korey Stringer Institute?

My first involvement with the Korey Stringer Institute was when I was asked to join a group to look at Youth Sport Safety nationwide. I was a representing the NATA and there was representation from ACSM and KSI as well. This group became known as the Collaborative Solution for Safety in Sport. From this point on I have maintained a great relationship with KSI and those who share my passion for safety in sport, especially for our youth!

In what ways has KSI impacted you?

KSI has given me the ability to stay up on the latest in best practices when it comes to the health and safety of athletes of all ages. KSI is always available and ready as a resource when questions arise. Because of KSI, Utah is a safer place to participate in sport related activities. Hundreds, if not thousands of young athletes across Utah, as well as their coaches and parents have a better understanding of how to remain safe when participating. My continued association with KSI helps me to keep my focus on safety and what I can do to make it continually better. KSI has made me a better clinician!

"KSI has given me the ability to stay up on the latest in best practices when it comes to the heat and safety of athletes of all ages. KSI is always available and ready as a resource when questions arise. Because of KSI, Utah is a safer place to participate in sport related activities."

-LISA WALKER
Could you tell us a little about yourself?

I serve as Director of Player Health and Safety for the National Football League. I am a part of the team at the NFL that works to support the league’s commitment to advancing programs in the diagnosis, prevention and treatment of sports-related injuries. In my role, I lead a number of initiatives aimed at promoting the health and safety of athletes at all levels including, crowdsourcing challenges to support innovators in protective equipment and athletic safety and performance, grant programs for independent medical research and youth athletic safety programs, and educational and outreach initiatives. I have worked at the NFL for about ten years. Prior to joining the NFL, I worked on Capitol Hill in Washington D.C.

Could you tell us about your first involvement/interaction with KSI?

The NFL is a founding partner of the Korey Stringer Institute, so I have been aware of the organization and its important work since its inception in 2010. It was when I transitioned to my current role at the NFL about five years ago that I began to work more closely with Doug and the team at KSI. In addition, to the incredible expertise Doug and his team provide, KSI has been an excellent partner on a number of programs aimed at promoting high school athlete health and safety, including a pilot grant program launched a couple of years ago that has aimed to increase access to athletic trainers for high school athletes.

In what ways has KSI impacted you?

Every time I have the opportunity to interact with Doug and his team, I am inspired by the passion and energy they bring to their work. Their enthusiasm is infectious, and it is exciting to work with a group of people with the same passion equal to their expertise and leadership on such important work.

Can you tell us a little about yourself?

I am a senior honors biology major with a minor in Sociology. I am from Shrewsbury, Massachusetts and decided to come to UConn not only because of the rigorous academic opportunities offered but also because of the friendliness of the students and faculty. My four years here have been filled with so many different opportunities and adventures and I have made friends with people that I am going to be friends with for the rest of my life. So, I don’t think twice about attending here at all. After graduation, I plan on going back to Massachusetts and attending BU Henry M. Goldman School of Dentistry this upcoming fall.

Tell us about your first involvement/interaction with KSI?

The research opportunities available on campus are one of the many reasons I chose this wonderful school. I originally heard about KSI my junior year from my friend. She told me about all of the different types of projects being done here and told me to reach out to Dr. Casa about possibly joining. He quickly responded asking to meet to see where I could help at KSI. This is when I was introduced to Dr. Huggins who heads the ATLAS project. I immediately fell in love with the project and wanted to help out as much as I could. It is such a rewarding feeling to see how this project is impacting athletic training coverage across the country. I am still currently working on this project as well as my honors thesis at KSI this semester.

In what ways has KSI impacted you?

KSI has really opened my eyes to the whole world of research and just how impactful it can really be. There is such a warm and welcoming environment in the lab that fosters growth and learning. I would also like to take a moment and thank the graduate students at KSI as well. I was fortunate enough to be able to work with most of them and to just see how passionate they are about the work being done instills their same level of passion in the undergraduate students. They are extremely open and are willing to take the time to teach you about all that kinesiology and athletic training has to offer. I honestly can’t imagine what my time here at UConn would be like if I had not joined KSI. I feel like they have taught me skills that I will use for the rest of my life.
Avoidable Death

Robert Huggins, PhD, ATC KSI, President of Research & Athletes Performance and Safety
Douglas Casa, PhD, ATC KSI, CEO

January 23rd, 2019
Reprinted with permission from The Jerusalem Post
Original Article: “Four years after US student died on desert hike, tour guide speaks out” (January 17th, 2019)

The article about the death of Ariel Newman, recounted from the perspective of Mr. Josh Ettinger, who served as the hike leader that day, has several claims that any medical expert trained in death due to exertion in the heat would contest.

The assumption that the syncope or fainting experienced previously by Newman and his mother years earlier are related to heat illness or some genetic predisposition are not supported by any medical mechanism or research. Furthermore, the suggestion by the hike guide that there was “no way to know for sure the cause of death” is grossly inaccurate based on the reported 43 C body temperature at the hospital and the circumstances in which the death took place.

Had the writer sought out comments from heat-related sudden death experts, they would have quickly understood that Newman did suffer from exertional heat-stroke (EHS) that day and his death was 100% preventable had proper precautions been in place. EHS occurs when one’s body temperature exceeds 40.5 C and the individual also demonstrates signs of mental status changes during exercise. EHS is a medical emergency, but death from EHS has been shown to be 100% preventable when proper precautions and treatment are in place.

In the case of Newman, there are several pieces of information that would suggest he could still be living today. Given the environmental conditions the day before (36.6 C) and the day of (36.5 C) his death hike in the Judean Desert, the intensity of the exercise on Day 2 (eight to 10 hour- 16km hike on a rapid pace to complete in just six hours), and the lack of physical fitness and the heat acclimatization status of Newman, it is clear that these factors overwhelmed his ability to cool, resulting in his medical evaluation via helicopter and core body temperature confirmed at the hospital of 43 C. This body temperature, the context of the case, and the fact that he died, confirm EHS was the cause of death, which was agreed upon and confirmed by the medical examiner.

While it appears that Mr. Ettinger did all he could given his IDF training from the treatment side of things by summoning a medical evacuation once he noticed Ariel was suffering from a medical emergency, the opposite can be said for what was done to cause the EHS. Little, if nothing, was done in this case to prevent Newman’s EHS.

It is unfortunate that the article so dramatically misinformed the public about current best practices regarding scientific and medical knowledge related to EHS. This misinformation could jeopardize many future lives.

International Olympic Committee (IOC) in Tokyo
As part of the IOC, Dr. Douglas Casa, Dr. Andrew Grundstein, and Dr. Yuri Hosokawa are preparing the 2020 Olympic Games for extreme heat

Hydration for Health Conference
Gabrielle Giersch received the “Pitch Your Science Competition” Young Research Award at the 11th Annual Hydration for Health Conference in Evian, France. She will be attending the 11th Annual Hydration for Health conference in France this year.

Physiology and Pharmacology of Temperature Regulation Conference (PPTR)
Dr. Douglas Casa, Dr. Rebecca Stearns, Luke Belval, and Gabrielle Giersch were invited to speak at PPTR in Split, Croatia.

Training Medical Staff for IAAF World Championship 2019 and FIFA World Cup 2022

Dr. Douglas Casa will be visiting Qatar to speak at the International Conference on Medicine and Science in Athletics hosted by Aspetar. He will also be training the Aspetar medical staff to appropriately recognize and treat Exertional Heat Stroke. This medical staff will be responsible for treating athletes at the IAAF World Championships in Athletics 2019 and FIFA World Cup 2022.
STATES KSI VISITED FOR SPORT SAFETY POLICY MEETINGS

States Visited So far
State High School Sport Health and Safety Policy Initiative

Samantha Scarneo, PhD, ATC
KSI, Vice President of Sport Safety

Brad Endres, MS, ATC, CSCS
KSI, Assistant Director of Sport Safety

Our nationwide campaign to increase the implementation of sports safety policies affecting high school athletes has continued to gain momentum. Since the initiation of the program, KSI has visited several states to work on improving health and safety standards across the nation.

We have facilitated state-wide Collaborative Solutions for Safety in Sport (CSSS) meetings with 6 states so far: New Jersey, District of Columbia, Oklahoma, Georgia, Utah, and Florida. Since last fall, the top five states remain the same with New Jersey leading the way with a score of 79, followed by North Carolina (79.03), Massachusetts (75.03), Kentucky (71.13), and Florida (62.45). These meetings have all been very fruitful in terms of continuing the conversation regarding improving high school sports safety, and some meetings have even resulted in policy changes.

We have also met with various stakeholders in many other states (pre-meetings) to plan out potential future state meetings: Louisiana, New Hampshire, Maine, Rhode Island, Pennsylvania, Indiana, Michigan, Illinois, and Ohio. We look forward to scheduling meetings with these states in the near future.

<table>
<thead>
<tr>
<th>State</th>
<th>Point Change (from initial rankings)</th>
<th>Rank Change (since Aug ’18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alabama</td>
<td>+ 2.5</td>
<td>25→24</td>
</tr>
<tr>
<td>Arizona</td>
<td>+ 2</td>
<td>19→18</td>
</tr>
<tr>
<td>California</td>
<td>+ 4</td>
<td>50=50</td>
</tr>
<tr>
<td>Colorado</td>
<td>+ 5</td>
<td>51=51</td>
</tr>
<tr>
<td>Connecticut</td>
<td>+ 4</td>
<td>38=38</td>
</tr>
<tr>
<td>Delaware</td>
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<td>32→34</td>
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<tr>
<td>District of Columbia</td>
<td>+ 2</td>
<td>20→23</td>
</tr>
<tr>
<td>Idaho</td>
<td>+ 6</td>
<td>39→36</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>+ 7.625</td>
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<tr>
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<td>+ 6</td>
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<td>15→7</td>
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<tr>
<td>Tennessee</td>
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<tr>
<td>Texas</td>
<td>+ 2</td>
<td>19→22</td>
</tr>
<tr>
<td>Utah</td>
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<td>30→18</td>
</tr>
<tr>
<td>West Virginia</td>
<td>+ 4.995</td>
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</table>
STATES MAKING POLICY CHANGES

April 2019 Changes
States who have made changes from August 1st, 2018-April 1st, 2019

[Map showing states in green]
What Goes into a State Meeting?

The state policy meetings are state-focused initiatives that follow the general model of the collaborative solutions for safety in sport meetings that have been organized at the national level over the past few years. It retains the focus of improving state health and safety policies to protect high school athletes, but also focuses efforts to involve key state-based stakeholders.

These meetings are designed as an opportunity for designated regional representatives of the state to gather to discuss sport safety efforts. On the day of the meeting, participants are divided into various discussion groups with the purpose of collaborating in order to improve the language and/or application of current state policies so that best practices are met. Each discussion group topic is decided by the key stakeholder who lives in that state. Attendees are placed into a discussion group based on interest. By the end of the day, each discussion group will decide if recommendations and/or policy changes should be presented to their state's sports organization for review and consideration.

### State Evaluations

<table>
<thead>
<tr>
<th>State</th>
<th>Score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 New Jersey</td>
<td>79.03</td>
</tr>
<tr>
<td>2 North Carolina</td>
<td>78.75</td>
</tr>
<tr>
<td>3 Massachusetts</td>
<td>75.03</td>
</tr>
<tr>
<td>4 Kentucky</td>
<td>71.13</td>
</tr>
<tr>
<td>5 Florida</td>
<td>62.45</td>
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<td>6 Missouri</td>
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<td>7 Oregon</td>
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<td>59.13</td>
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<tr>
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<tr>
<td>14 Arkansas</td>
<td>56.83</td>
</tr>
<tr>
<td>15 New York</td>
<td>55.75</td>
</tr>
</tbody>
</table>

State Policy Highlights

- West Virginia: Added licensure for Athletic Trainers
- Colorado: Added licensure for Athletic Trainers
- Connecticut & Utah: Added required education of sudden death prevention to coaching certification
We plan to visit all 50 states to help implement best practices for preventing and managing leading causes of sudden death in secondary school athletes.

**These are examples of some of the things KSI has assisted with since its founding in 2010**

**Utah**
The sports medicine advisory committee of the Utah High School Activities Association worked with KSI to implement mandatory cooling tubs on site and to educate constituents about reducing core body temperature quickly in cases of exertional heat stroke.

**Oklahoma**
Oklahoma is working towards improving its emergency action plan and its policies related to heat acclimatization, WetBulb Globe Temperature (WBGT) use, traumatic head injuries, and cold water immersion.

**Missouri**
KSI representatives presented a lecture and hands-on training for emergency treatment of exertional heat stroke at the CoxHealth Sports Medical Conference in Springfield. This training was put to the test a month and a half later, when CoxHealth members successfully recognized and treated an athlete suffering from exertional heat stroke.

**Vermont**
Vermont revised their environmental monitoring policies to ensure that heat policies are based on use of WetBulb Globe Temperature (WBGT) devices and required in all schools.

**Massachusetts**
KSI has worked with Massachusetts to update its environmental monitoring policies and promote use of WetBulb Globe Temperature (WBGT) devices. KSI volunteers also work at the medical tent at the Falmouth Road Race on Cape Cod to ensure that participants with symptoms of heat stroke are treated properly.

**Connecticut**
Connecticut has collaborated with KSI to add rectal thermometers to the minimum equipment list for all ALS and BLS ambulances and update their EMS protocols with best practices for recognition and treatment of exertional heat stroke.

**Washington D.C.**
Members of KSI traveled to Washington D.C. to discuss the District’s policies on environmental monitoring during sport, cold water immersion, and athletic training services in schools and athletic organizations.

**New Jersey**
New Jersey was one of the first states to implement heat acclimatization policies for high school athletes. The state also recently implemented mandated policies for treating exertional heat stroke with cold water immersion, monitoring strength and conditioning sessions, and returning to play and school following traumatic head injuries.

**Arkansas**
KSI has worked with Arkansas to ensure that all schools and athletic organizations develop an emergency action plan for managing sport-related injuries, have cooling tubs on site to treat exertional heat stroke, and provide coaching education on topics related to sudden death in sport.

**Georgia**
The Georgia High School Athletic Association (GHSA) mandated policies related to modifying outdoor practices based on the environmental conditions. The GHSA now requires member schools to use a WetBulb Globe Temperature (WBGT) device, which provides a comprehensive measure of the environmental conditions.

**Florida**
KSI has worked with Florida to improve their emergency preparedness policies. Florida has also implemented coaching education policies related to exertional heat illness, sudden cardiac arrest, and traumatic brain injuries.

**Hawaii**
KSI assisted with the acquisition and implementation of WetBulb Globe Temperature (WBGT) devices in high schools across Hawaii.

**Texas**
Texas strengthened its policies on training during high heat and humidity to protect athletes against exertional heat stroke.
UPCOMING EVENTS

International Conference on Medicine and Science in Athletics
May 3-5, 2019
Doha, Qatar

Korey Stringer Institute 8th Annual Gala
May 9th, 2019
New York City, NY

American College of Sports Medicine 66th Annual Meeting
May 28th-June 1st, 2019
Orlando, FL

KSI Medical and Science Advisory Board Meeting
May 28th, 2019
Orlando, FL

National Athletic Trainer’s Association Meeting
June 24th-June 27th, 2019
Las Vegas, NV

Hydration for Health 11th Annual Meeting
June 25th-June 26th, 2019
Evian, France

National Strength and Conditioning Association
July 10th-July 13th, 2019
Washington D.C.

KSI Team Ragnar Relay Race
August 16-17th, 2019
West Windsor, VT

Falmouth Road Race
August 18th, 2019
Falmouth, MA

Washington State Policy Meeting
September 12th, 2019

Delaware State Policy Meeting
October 10th, 2019

Maryland State Policy Meeting
October 11th, 2019

Army 10-Miler
October 13th, 2019
Washington D.C.

HEATT Technology Summit
October 17-18, 2019
University of Connecticut

Recommendations for Heat Acclimatization

1. Attain adequate fitness in cool environments before attempting to heat acclimatize.

2. Exercise at intensities >50% VO_{max} and gradually increase the duration (up to 90 min/day) and intensity of the exercise sessions during the first 2 weeks.

3. Perform highest-intensity workouts during the cooler morning or evening hours and other training during the hottest time of the day.

4. Monitor body weight to ensure that proper hydration is maintained as sweat rate increases.

5. Athletes who live in cool environment but will travel to a hot environment for competition can induce partial acclimatization by wearing insulated clothing, although they should leave some skin surface uncovered and monitor temperature to avoid hyperthermia.

ATLAS Project: From Little Napkin to Large Impact

Robert Huggins, PhD, LAT, ATC
President of Research & Athlete Performance, KSI
Director, ATLAS Project

THE NAPKIN:

Four years ago, while eating dinner at Dos Caminos Restaurant following the 1st Collaborative Solutions for Safety in Sport meeting at the NFL Headquarters in New York City, Rob Huggins, Larry Cooper, and Ronnie Harper puzzled over something at their table as if they’d won the lottery. Unbeknownst to the other tables surrounding them, they were fully invested in a little napkin. They were passionately discussing an idea they had. What to name this idea, this profound and novel project? They knew in their hearts that this idea had the capability of drastically impacting the profession of Athletic Training in the secondary school setting. While sitting at their table late into the night hours, long after the formal dinner was over and the reserved space opened back up to the guests, did they finally come up with the name. Scribbled on the napkin, amongst a multitude of scratched out letters, words and phrases somewhat resembling a scrabble game or wordle of sorts, were the letters ATLAS across the top. Written vertically beneath where the words, Athletic, Training, Locations and Services. It was at that moment that the ATLAS Project was born. A project that the three knew would not only change Athletic Training, but the lives and healthcare of hundreds of thousands of high school athletes.

THE PROCESS:

From that subtle little napkin sprouted The ATLAS Project. Dr. Rob Huggins, then a post-doctoral fellow working at KSI, went to work. With Larry’s help he recruited the assistance of the NATA Secondary School Athletic Trainers’ Committee and got the NATA on board to support the project’s mission. First KSI developed a mapping system that publicly displayed all the known locations of every high school in the US and the extent of their AT services, all while merging in data from the National Center for Education Statistics and the previous study conducted by KSI on behalf of the NATA known as the Benchmark Study. In this study KSI successfully called every single public and private high school in the US over a 4.5-year period to determine the level of AT services nationwide, yielding an over 50% response rate. Using these data, KSI mapped each school and used these public maps to categorize the remaining 50% of schools where AT services were unknown. During this same time, KSI developed an online survey instrument asking questions related to school demographics, employment status and model, time spent on AT service-related duties, insurance, emergency equipment, school budget and more. Via both of these mechanisms (online survey and contacting of ATs/schools), and thanks to the NATA SSATC committee and hundreds of other passionate secondary school ATs, on February 21, 2018 every school (nearly 20,300) and the extent of their AT services were mapped. At this point in time, the ATLAS Project achieved its first major goal. This once thought insurmountable task was complete and now it was time to see what meaningful impacts it could make.

THE DATA

Armed with the knowledge related to the AT services in every high school with athletics in the US and with thousands...that’s right, thousands of surveys being completed and updated on the maps in real time, KSI produced the first annual ATLAS Report and delivered it to the NATA, its members, and to the rest of the world. The primary findings as of April 2018 were that 66% of schools in the US had AT services and of those, 35% were full time, 31% were part time. Perhaps more surprisingly, 34% of schools with athletics in this country were receiving absolutely no care whatsoever from an AT. Other significant findings were that 69% of public schools and 55% of private schools had access to AT services and that the more populated the locale, the greater the access to AT services with city schools and suburban schools having more access than town or rural schools. While the 2018-2019 academic year numbers are still pouring in, as of April 2019 the map on the page 18 depicts the current access to AT services in the US and the infographic on page 17 depicts the employment status.

THE IMPACTS:

Now it was truly time to see what ATLAS could do. While gaining notoriety among the Athletic Training community, especially the high school community, requests for the data started pouring in. Requests came from athletic training association state governmental affairs committees to support or block various legislative initiatives (see Jason Cates’ story on Arkansas on page 19) while other requests targeted strategic agenda items to improve best practices. Requests from individual ATs asking for data to demonstrate to their administration where their school stood relative to surrounding towns or counties. The state of Florida even requested permission to make their own ATLAS Page with ATLAS maps embedded and school survey compliance within, so that they could do their part to promote participation in the survey and so the state association could benefit from the data and target strategic efforts. Many other states followed suit, including Connecticut, Vermont, DC, Rhode Island, North Carolina, New York, Wyoming, New Mexico, Massachusetts and the mid-Atlantic, southeast, rocky mountain, northwest and eastern athletic trainers’ associations.

"Scribbled on the napkin, amongst a multitude of scratched out letters, words and phrases somewhat resembling a scrabble game or wordle of sorts, were the letters ATLAS across the top."
Since this move to embed the maps on the state and regional association web-sites KSI has seen dramatic improvements in survey participation and overall awareness. Again, the state of Florida requested legislative-district specific information to develop informational flyers and cards to hand to their legislators during their annual “hit the hill day” during national athletic training month this past March. From the research perspective, Dr. Huggins, Kelly Coleman, Brad Endres, Sarah Attanasio, Brandon Baker and Miwako Suzuki have presented ATLAS data at NATA in 2018 and/or are presenting in Las Vegas this year. Furthermore, the first ATLAS Project manuscript to update the national numbers is in review and four other manuscripts examining: 1) social determinants associated with AT services, 2) the landscape of AT services and the ratio of ATs to sports and student athletes, 3) the odds of having venue-specific emergency action plans when standing orders are in place, and 4) the impact of socioeconomic status on secondary school athletic training healthcare in the US are in the works so be on the lookout for those key publications. As is true with all good “bar napkin ideas,” what began as a pipe dream is coming true before our very eyes. The ATLAS Project is beginning to make its mark thanks to the efforts of many and both KSI and the NATA are proud of what the ATLAS Project has become. Only time will tell what ATLAS will achieve next.
National and State Access to Athletic Training Services in Secondary Schools*

*As of April 2019
How Has **ATLAS** Helped You?

The ATLAS Project, in association with the NATA, worked with countless individuals and organizations, supporting their endeavors in promoting the Athletic Training profession. We asked some of these individuals to share their stories of how the ATLAS Project helped them.

"It was during the 91st Arkansas General Assembly (2018) when the ATLAS Project helped the Arkansas Athletic Trainers’ Association (AATA) defeat a bill that was on the docket. During the 91st general assembly the AATA was attempting to update our state athletic trainer’s practice act. In an attempt to make us fight two battles at one time the physical therapists (PTs) had a member of the house of representatives (who was also a PT) draft and enter a piece of legislation that would essentially do away with the profession of athletic training within our state. Even though the ATLAS Project was in its infancy at that time (phase I of the mapping had just been completed), we were able to pull the numbers and show where athletic trainers were in the secondary school setting throughout our state. Utilizing this information, we were then able to calculate school district enrollment, the number of athletic trainers working in those districts, as well as approximate the number of athletes, parents/guardians, siblings, coaches, teachers, administrators, extended family, other health care professionals, specialists, etc. that would have been affected by this bill. We were able to find means to contact those individuals to start writing letters, emailing, and making phone calls opposing the legislation against the profession of athletic training. We were able to show with certainty that those legislators that would be seeking re-election would have a hard time doing so if the PTs bill was not defeated. The message was heard loud and clear to the point we were hearing from the legislators begging us to stop the campaign. Once the bill was dead, we then called off our efforts that were afforded us by the ATLAS Project. The ATLAS Project once again helped us when the member that drafted the bill tried to run for re-election and we were able to remind his constituents in his district what he had tried to do in the previous session and he was beat handily by his opponent that used athletic health care as one of his points of emphasis and has befriend our state association."

Jason Cates, ATC, LAT, Secondary School Athletic Trainer, Arkansas

"Atlanta is the major population hub of Georgia, but outside the urban sprawl, the landscape quickly becomes rural and loosely populated. When a South Georgia football powerhouse travels to Mercedes Benz Stadium to a team from the Atlanta Area, both ATs want to discuss athlete care and venue issues before arriving. ATLAS makes communication among fellow ATs possible, and the Georgia Athletic Trainer’s Association (GATA) supports the ATLAS project as a way to unite high school Athletic Trainers throughout the state. Over the past five years, members of KSI and of the GATA SSAT Committee work together through emails, direct phone calls, and social media to grow the reputation of ATLAS and to get Georgia 100% mapped. Because Georgia High School Association (GHSA) supports the GATA and values Athletic Training, the organization assisted in 2019 by sending the ATLAS Surveys to member schools, which made a large difference in survey completion and updates. I believe that the number of SSATs is growing in Georgia, but the ATLAS map clearly highlights that city/suburban schools are more likely to have AT access than rural communities do. I believe the knowledge gathered by the survey is invaluable to furthering the goal of having an AT in every high school."

Katie D. Terrell, MS, LAT, ATC, EMT-B
Georgia Athletic Trainer’s Association Secondary School Representatives

"KSI has been instrumental in helping Athletic Trainers' Association of Florida (ATAF) promote and improve the athletic training profession at the secondary school level in the state of Florida. For over two years KSI and the ATAF have worked collaboratively to help drive ATLAS survey completion and build a more accurate map of the profession in the state. The ATAF also collaborated to create a web page to further promote the ATLAS initiative of having 100% ATLAS survey completion. Check it out here: https://www.ataf.org/atlases. This web page was modelled for many other states and regional organizations. ATLAS KSI was able to provide legislative district specific data that was then used to create individual reports to present to Florida State Senators at the 2019 Hit the Hill day in Tallahassee. From full time athletic training coverage to access to best practice emergency and heat illness equipment, ATLAS data was used to demonstrate the value that the secondary school athletic trainers bring, and served as a crucial point of conversation to help drive policy change to create a better environment for student-athlete safety in the state of Florida."

Dustin Gatens, MS, ATC
ATAF ATLAS Initiative Chair

Spring 2019  19
**KSI IS WORKING TO ENHANCE SAFETY IN PHYSICAL ACTIVITIES BY PROMOTING ORGANIZATIONS TO:**

1. Have an athletic trainer on site for all activities
2. Have an automatic external defibrillator (AED) within 1 minute of each activity venue
3. Develop and implement an emergency action plan
4. Educate athletes and coaches on the causes of sudden death in sport
5. Mandate pre-participation physical examinations
6. Educate athletes and coaches on traumatic head injuries
7. Cool first, transport second for treatment of exertional heat stroke (EHS)
8. Educate coaches and athletes on the dangers of sickle cell trait
9. Prevent EHS through heat acclimatization and WetBulb Globe Temperature (WBGT) monitoring
10. Require all coaches to be CPR/First Aid Certified

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### Top High School Sports Safety Policy Scores

<table>
<thead>
<tr>
<th>STANDINGS</th>
<th>STATE</th>
<th>SCORE (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>New Jersey</td>
<td>79.0</td>
</tr>
<tr>
<td>2</td>
<td>North Carolina</td>
<td>78.8</td>
</tr>
<tr>
<td>3</td>
<td>Massachusetts</td>
<td>75.0</td>
</tr>
<tr>
<td>4</td>
<td>Kentucky</td>
<td>71.1</td>
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<tr>
<td>5</td>
<td>Florida</td>
<td>62.5</td>
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<tr>
<td>6</td>
<td>Missouri</td>
<td>62.0</td>
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<tr>
<td>7</td>
<td>Oregon</td>
<td>61.6</td>
</tr>
<tr>
<td>8</td>
<td>South Dakota</td>
<td>60.6</td>
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<td>West Virginia</td>
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<tr>
<td>11</td>
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<tr>
<td>14</td>
<td>Arkansas</td>
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</tr>
<tr>
<td>15</td>
<td>New York</td>
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</tbody>
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All scores are current as of April 1st, 2019
Current state scores can be found at: ksi.uconn.edu

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**ARE YOU PREPARED FOR HEAD INJURY?**

**Prevention**
Assure proper tacking and block technique and limit contact time

**Recognition**
Be on the lookout for altered consciousness, neurological, concerns and midline spine pain immediately after a blow to the head or neck

**Athletic Trainers**
Responsible for concussion evaluation (including sideline concussion assessment tool 5) and providing education to the community

**Post Injury**
If symptoms begin to worsen, call 911. Stabilize the patient and begin CPR promptly, if necessary

**Return to Play/Learn**
Patient must have a written release from a healthcare professional with a gradual stepwise return to play protocol

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**ARE YOU PREPARED FOR SUDDEN CARDIAC ARREST?**

**Pre-Participation Exam (PPE)**
Athletes should have a PPE that includes family history of cardiac events

**Equipment**
AED should be accessible within 1 minute of venues or events and maintained

**Training**
Coaches should have and stay current with AED/CPR and first aid certification

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**ARE YOU PREPARED FOR EXERTIONAL SICKLING?**

**Sickle Cell Trait (SCT)**
People with SCT can have a sickling crisis with too much exertion which causes blood cells to sickle, causing a decrease in oxygen to the body

**Prevention**
PPE, that includes knowledge of sickle cell trait status, modifications to activity, hydration, acclimatization, education sickle cell trait athletes of early recognition

**Possible Triggers**
Altitude, heat, high intensity exercise that is unique to the athlete, or dehydration

**Signs and Symptoms**
Lower extremity/back pain, cramping, fatigue, shortness of breath, slow collapse, etc.

**Treatment**
Removal from play, oxygen, rest, cooling, assess vital signs
KSI Elite Athlete Testing
Cody Butler, DPT, CSCS
Assistant Director of Research

Tell us about yourself. How’d you get involved with triathlons? What brought you to KSI?

My name is David Garcia, 37 years old. I was born and raised in Panama where I got a bachelor’s degree in civil engineering. Later on, I got a master’s degree in structural engineering focusing on earthquakes from UC Berkeley, California. I then worked in Seattle for 4 years designing skyscrapers. In my late 20’s, I moved to Barcelona for an MBA. Post MBA, I moved to NYC to work in the financial industry, providing investment advice to ultra-high net worth individuals in the Private Bank in Citigroup.

Most of my life, I have been a competitive soccer player. In my mid-thirties, I realized that the recovery process after a game was getting longer and longer and minor injuries were taking too long to heal. Also, with the nature of a team sport, practice sessions were required, taking a massive amount of coordination, given the busy lives of my team members. The alternative was to become a weekend warrior. So, at the end of 2017, I decided to hang up the boots. However, I was concerned that given the lack of sport-specific practice, I was setting myself up for serious injury, and having been active my entire life, I needed a sport that could fill that void.

That is how my triathlon journey began. Triathlon was a good fit for me as it required a level of commitment greater than a weekend warrior. The problem was I didn’t know how to swim. Early on in my journey, I thought that would be my problem — naive of me. In January 2018, I joined Full Throttle Endurance (FTE) NYC to learn the ropes of the discipline. Nothing better at such an early stage to train next to experienced athletes to avoid costly mistakes. As my training progressed, I was getting acquainted with the adaptations my body was going through and became more aware of the physiological challenges I was starting to face: fitness, mobility, nutrition and hydration. As I started to address these challenges with a specific mindset, my research on topic-specific items such as the importance of my own specific needs for electrolyte replacement and proper caloric intake broadened. One of the coaches of FTE mentioned the Korey Stringer Institute at the University of Connecticut (UCONN) that specializes in studying sweat output in athletes and its application to the athlete.

Can you describe the testing experience?

The testing experience was very enlightening. Dr. Huggins and his team went through the testing protocol. Besides performing a rigorous set of exercises under controlled conditions, the sessions included a good amount of education. Dr. Huggins went over the underlying theory behind what we were doing and how the test would help me to improve my performance and keep me healthy. The concept was very simple but the implications massive: the body needs to maintain a certain temperature to function properly. Sweat acts as a main body temperature cooling mechanism. As the body has a limited amount of liquid, we need to constantly replenish it in order to allow the body to function. It would be easy enough to do if the amount and composition of that liquid were not environmental and individual specific as well as gastrointestinal limitations.

What were the main takeaways for you from the test? How has the testing been beneficial to you?

The testing objective was to propose quantities and composition over periods of time given the gut limitations. For me, the main takeaways were: 1) My individual fluid intake and composition needs; 2) caloric and electrolyte needs (I was under-hydrating, under-fueling and under-consuming electrolytes during exercise in the heat)

I am 4 months post-test and I can tell that it has tremendously helped my triathlon journey. While there are still many other challenges to address, I am happy that my hydration needs are something for which I have a plan and are no longer a mystery.
Could you tell us about yourself?

I’m the Associate Director of Research at the Korey Stringer Institute. I grew up in Virginia and am an alumnus of Roanoke College (B.S. ’14) and James Madison University (M.S. ’16). My research interests include environmental physiology, female specific responses to exercise and environmental stress, and human adaptive capacity.

Could you tell us about your first involvement/interaction with the Korey Stringer Institute?

My first interaction with the Korey Stringer Institute was when I contacted Dr. Casa about the possibility of pursuing a Ph.D. at the University of Connecticut in 2015. I visited the Korey Stringer Institute for the first time the day after the super bowl in 2016 when the campus was closed for a blizzard. Even though I only met Dr. Casa and Dr. Armstrong, I got a very good sense of the capacity of KSI and knew that it was the place that I should go to work and pursue my Ph.D.

In what ways has KSI impacted you?

KSI has made me a better researcher and enhanced by ability to think through the practical application of research by translating results of research to a population to enhance safety and performance. In my time at KSI I have had the opportunity to work on several military funded research studies that have enhanced by skillset and knowledge of research processes in extreme environments. KSI has allowed me to grow as a researcher and better understand, synthesize, and develop research projects to answer important questions for the athletic, warfighter, and laborer population.

KSI Visiting Scholar Experience

I am a PhD student at Nagoya University in Japan. I am working with the Korey Stringer Institute at the University of Connecticut for the academic year 2018-2019. I am very honored that I was able to spend time in one of the most advanced research institutions in sport and health science world. I have deep gratitude for the members of KSI.

This is actually my second visit to KSI. This time around is different because I was able to spend a whole year learning about sport safety policy. I was also able to assist in heat and hydration research projects research conducted at KSI. The majority of my time was spent working with a study involving sports safety. This study in particular aims to improve quality of health and safety of youth athletes. Dr. Samantha Scarenno, Vice President of Sport Safety, gave me lots of opportunities to understand the theories and practical procedures of sports safety policy. According to the socio-ecological framework (SEF), a public health theory, changing the policy and procedure of an organization is one of the most effective interventions to improve individual attitude and behavior toward athletic injury. Unfortunately, many sudden deaths in sports occur every year in Japan. Colleagues and I are working to change this circumstance in Japan. I also think Japan needs to have the best-practices statements. Currently, there are no best-practice statements of athletic injury in Japan to prevent sudden death in sports. I believe the SEF model will help us immensely. We need to provide high quality scientific evidence to create policy amongst healthcare providers, coaches, and sport organizations.

Researchers in Japan, including myself, should supply valid evidence to the field of sports medicine. I will try it as hard as I can. I have gained a lot of knowledge and learned different research methods about sports safety policy from KSI. I believe that the experience I gained from this year abroad is a critical moment in my life as a sport safety policy researcher.

Lastly, I deeply appreciate my wife Kumiyo, my daughter Chihona, and other family members. I could not have this amazing experience without their support.
We are proud to announce that Loudoun County Public Schools has approved an exertional heat stroke (EHS) protocol that includes the use of rectal thermometry. We hope this decision will encourage other school districts in Virginia and throughout the United States that are having difficulties convincing their administrators about the vital importance of rectal thermometry to continue their pursuit.

In the past, our school district administration was adamantly opposed to approving rectal thermometry. They denied our athletic trainers, on numerous requests, permission purchase and use rectal thermistors. Ironically, this past fall, one of our cross-country runners suffered EHS during a championship meet. The athletic trainers and EMS volunteers immediately assessed the student-athlete's internal body temperature at 107.7 degrees via rectal thermometry, placed him in an ice water immersion tub and didn't transport him to the ER until his internal body temperature dropped to 102 degrees. Fortunately, the student athlete was released from the ER later that night with no organ damage and made a full recovery.

By following best practice guidelines in the treatment of EHS, the athletic trainers and EMS volunteers almost certainly prevented a catastrophic outcome. This incident, once again, brought the need for our school district administration to approve the use of rectal thermometry in the treatment of EHS to the forefront. After an eight-month process to help educate the administration on the vital importance of rectal thermometry, we finally received consent and this policy is now officially part of our EHS protocol.

This policy implementation wouldn't have been possible without the support of several individuals. First and foremost, we had the support of our athletics supervisor. Second, we received support and the go-ahead from our health services' supervisors and director. Third, we received approval from our school administration director to include our EHS protocol in the LCPS policies and procedures section of the student athlete handbook.

The key to our success was a team approach. With the help and support from many individuals—most notably the LCPS athletic trainers, orthopedic physicians and staff from the National Sports Medicine Institute, researchers at the Korey Stringer Institute, Dr. Kevin Miller at Central Michigan University and Darryl Conway at the University of Michigan, we were finally able to convince our administration to allow the medical professionals in the school system to make the medical decisions and act within published best practices.

With patience and perseverance, the LCPS athletic trainers were able to accomplish the goal of getting an appropriate EHS protocol approved to ensure the future health and safety of LCPS student athletes who may suffer from EHS.

Sincerely,
Paul Peterson, MA, LAT, ATC
Woodgrove High School (Virginia)

"BY FOLLOWING BEST PRACTICE GUIDELINES IN THE TREATMENT OF EHS, THE ATHLETIC TRAINERS AND EMS VOLUNTEERS ALMOST CERTAINLY PREVENTED A CATASTROPHIC OUTCOME."

-Paul Peterson
The videos, peppered around the internet, can be captivating—college football players pushing or pulling an inordinate amount of weight, their sweat and strain accompanied by heavy guitars or thumping bass. Set in weight rooms, cinderblock walls and wooden platforms adorned with the logos of major programs, these five-minute montages show young men demonstrating remarkable strength. The stirring presentation is catnip for fans and future recruits alike.

Look closer, though, and cracks start to show.

A student-athlete struggles through a squat as the barbell and his torso list to one side while the teammates encircling him shout for him to finish.

Another: Though he is performing an exercise meant to target his arms, a player’s entire body shakes violently and his back contorts as he curls a barbell laden with chains toward his chin. His teammates and coaches nod and scream.

Still another: A strength coach boasts that his primary charge is to foster mental toughness, not improve physical performance, as players are shown running stadium steps under the scorching sun.

"If they can make it through our two hours in the summer ... "

All of this aimed at forging the camaraderie they will lean on when third quarters yield to fourth quarters. But the mix of machismo and mediocre form glamorized in these videos portends an issue that carries serious consequences: Some young athletes’ bodies are being pushed beyond reasonable limits as a means to harden their minds.

According to the National Center for Catastrophic Sport Injury Research, 85 college athletes died from 2000 to 2016 from indirect causes related to their sport. (Indirect causes of death, such as heatstroke and sudden cardiac arrest, occur when overexertion causes one or more of the body’s key systems to fail.) Of those 85 deaths, 40 percent were football players. And according to Scott Anderson, Oklahoma’s head athletic trainer who has published research on the subject, 23 Division I football players alone have died from indirect causes since 2000. Most of the deaths occurred after workouts or conditioning drills, including a Maryland offensive lineman who died in June.

The prevalence of catastrophic events in football does not surprise those who have examined the issue closely. Experts see the strength and conditioning field still struggling to agree on uniform professional standards. And the relatively young profession continues to be influenced by a sport whose popularity has fostered a sometimes dangerous—and persuasive—culture.
Where does the line fall between improving student-athletes' performance and pushing them into peril? Though many strength and conditioning coaches adhere to safe practices, rooted in established exercise science, the field has never reached the type of uniform standards that could offer a definitive answer. Consequently, that discord has made it difficult for the NCAA and other athletics organizations to rely on established professional norms to offer guidance to athletics departments. The resultant environment leaves room for potentially hazardous workouts.

So, the NCAA is encouraging the field's two widely recognized credentialing bodies to find common ground, the first step toward creating comprehensive guidelines that can better protect student-athletes. To get there, sports medicine experts say, the strength and conditioning profession needs to close its internal divide and find consensus. Even then, will better hiring and credentialing practices—and eventual baseline standards governing the conduct of strength and conditioning professionals—be enough to counter football's long-standing customs?

Until that puzzle is solved, experts say, college athletes will remain at risk. Chuck Stiggins, executive director of the Collegiate Strength and Conditioning Coaches association and one of the profession's most ardent defenders, says deaths and serious injuries don't have to be training's byproducts.

Inarguably, though, they long have.

"One death," Stiggins insists, "is too many."

A 2013 paper in the American Journal of Sports Medicine found that college football players were 3.6 times more likely to die from indirect causes than their high school counterparts. And, in recent years, indirect deaths at the college level have occurred at roughly five times the rate of those who died as a result of playing the sport.

Athletes are most vulnerable when they return to campus from breaks over the summer and holidays. Fatalities peak in these February and August transition periods, when athletes need to gradually reacclimatizes to their sports' physical rigor—a sign that some are being driven to do too much, too soon.

"They're dying in winter; they're dying in summer; they're dying in August preseason," Anderson says. "They're not dying playing football."

In 2015, Division I implemented legislation requiring schools to employ strength and conditioning coaches with a "nationally accredited strength and conditioning certification." Division II took a similar path a year later, mandating a "nationally recognized" certification. (Division II already had a similar rule in place.) But those developments are dampened by language that is, by necessity, imprecise because of the field's inability to come to a consensus on how it should be regulated. A Google search for strength and conditioning coaching certification yields a slew of options, showing the industry itself has not yet settled on what a nationally accredited strength and conditioning certification means.

Amid a sea of others, two major credentialing organizations stand out. One is the National Strength and Conditioning Association, which awards credentials across several disciplines within the field. The other is the CSCCa, which launched in 2000 and is tailored specifically to strength and conditioning coaches for college and professional teams.

The NSCA and CSCCa wrote a joint letter to the NCAA in March 2017 in hopes of giving more credence to their credentials. The letter urged the NCAA to set a series of mandates: Require college strength coaches to carry a credential from a group overseen by their shared accrediting body, the National Commission for Certifying Agencies; require a minimum of a bachelor's degree; include a continuing education component; and require first aid, CPR and automated external defibrillator certification.
The two groups that penned the letter meet those requirements. But there are many others, offering purportedly similar credentials, that don’t. The CSCCa’s specifications are particularly stringent, requiring all that was proposed in the letter in addition to a 640-hour internship overseen by a CSCCa-approved mentor, a comprehensive scientific written exam and a practical certification examination that requires creating a detailed strength and conditioning program and defending it in front of a panel of veteran strength and conditioning coaches. The NSCA requires a written test in addition to the letter’s requirements. About two-thirds of CSCCa candidates have passed those tests in recent years, and little more than half of first-time NSCA candidates pass. The letter precipitated a meeting in June 2017 at the NCAA national office in Indianapolis, attended by leadership of the NCAA Sport Science Institute and leaders from the NSCA and CSCCa.

The NCAA representatives urged the strength and conditioning coaches to follow the path of comparable health professions—such as physicians, athletic trainers, physical therapists, among others—and seek state regulation (for example, state licensure), which would require the field to precisely define itself and agree on uniform credentialing requirements. In other professions, an acknowledged single credential is a prerequisite before making a case to states for regulation.

For example, in the athletic training profession, the Board of Certification serves as the sole credentialing organization. Incorporated in 1989, the body establishes educational requirements for the profession, issues a common credential and works with state regulatory agencies to ensure credentialing standards are palatable. The NCAA, however, is not appropriately positioned to play a similar role and declare as mandatory one of the two credentials or an overarching accrediting body. The Association has not set such precedents before for athletic trainers or physicians, for instance, who are licensed by states.

“Are these individuals coaches? Or do they somehow have a performance or a medical subspecialty?” asks Brian Hainline, the NCAA chief medical officer. “They need to define themselves better, and haven’t.”

At the meeting, the strength and conditioning representatives blanched at the licensing idea. The process in each state would be too onerous, they said, particularly for coaches at major Division I programs, who often move from school to school with sport coaches. (At other levels, strength coaches tend to move less frequently, reporting to an athletics administrator rather than the coaching staff.)

The disagreement didn’t end at an impasse, though. The groups agreed to formulate comprehensive guidelines to mitigate catastrophic injury and death, with a focus on safety during conditioning sessions and transitional periods. The concept is similar to recent interassociation approaches related to concussion management and independent medical care, which set professional expectations in those areas throughout college sports. (The NCAA does not act unilaterally when publishing guidelines, instead seeking endorsement, significant contributions and feedback from key sports medicine and other medical organizations.) The conditioning guidelines could be published as soon as this year.

And the CSCCa agreed to join a third-party registry that the NSCA co-founded, which helps athletics administrators either verify credentials when making a hiring decision or determine whether current staffers’ credentials are up-to-date. A pair of recent, well-publicized incidents involved coaches whose credentials either came from other credentialing groups or were falsified. One occurred at Oregon, in which several football players developed exertional rhabdomyolysis, a preventable condition in which rapid muscle breakdown leads to kidney damage. In the other, at Kent State, a player died.

“We want to be unified as one voice so that people know that these two major organizations are on the same page,” Stiggins says, “and that health and safety is the No. 1 priority.”

“Despite some initial tensions, Hainline agrees: “I think at their heart of hearts, they truly want what’s best for the athlete.”

But will the talk of credible credentialing, higher standards and other solutions stand up when crossing paths with decades of culture built around forging toughness and testing limits? Even immaculate credentialing, hiring processes and recognized standards can fall prey to simple mistakes. “You can’t legislate or credential people to do their jobs well,” says Randy Cohen, associate athletics director for medical services at Arizona. Stiggins agrees, citing that mishaps often happen in well-regarded fields like medicine and law. “No field is perfect,” he says, stressing that his organization uses education and science to limit errors.

What that viewpoint ignores, critics say, is that injuries and deaths are not generated simply by errors or bad actors, but by an ethos that sees value in pushing athletes beyond the physical demands their sport necessitates. Work-rest ratios in conditioning drills, for instance, often far exceed those experienced during games. The public and media alike often point fingers at strength coaches when a player dies, but Stiggins insists the problems lie with traditions within sports like football. For instance, the CSCCa doesn’t condone using arduous workouts for punishment, yet punishment drills remain common throughout college football and other sports.
Many Division I college strength coaches hold one or both of the major credentials that require stringent training and education, and they strive to implement sound regimens. Still, without the backing of professional guidelines or legislated rules to validate their stance, some feel powerless to push back against sport coaches convinced that heroic workouts develop toughness and camaraderie. “It’s like the Wild, Wild West,” says Douglas Casa, chief executive of UConn’s Kory Stringer Institute, a research and advocacy group devoted to preventing sudden death in sport.

Why is the problem more pronounced in football relative to other sports? There are rational explanations: Cohen points to massive roster sizes—which often exceed 100—and the difficulty strength coaches have in tailoring workouts to athletes who have an array of conditioning levels. The sheer number of players, Cohen says, forces strength coaches to find a middle ground that can be too strenuous for less adept athletes, but doesn’t challenge elite players.

But in his three decades in the field, Cohen also has seen strength coaches forced into difficult positions by the sport coaches who hold enormous sway over their careers. “(Strength coaches) don’t want to be the guy out there making a guy do 1,000 up-downs because he didn’t go to class,” he says. “They do what someone else wants to do because they want to keep their job.”

Stiggins says his group tries to use continuing education sessions at its annual national conference, and even direct contact with coaches holding his organization’s credential to encourage safe program design and implementation and to prepare them to resist if workouts they are ordered to oversee grow unreasonable. “I cringe in January and August, and I send email after email, and I call coaches,” Stiggins says. “You’ve got this knowledge, and you’ve got the skill. Now please, please make sure that you use good judgment and never be manipulated by any sport coach. Always make good choices.”

Mario Price, director of coaching education at the American Football Coaches Association, insists safety is a priority among its members. The group teaches football coaches about safe training practices at its annual convention and via an online library. “They’re highly engaged in these sessions,” Price says. “Those coaches are working toward implementing great programs that protect the players.”

Still, some within college athletics believe mandating that strength coaches report directly to an athletics administrator, the medical director or to student health services—rather than a sport coach—is a potential solution. Nate Moe, assistant athletics director for strength and conditioning at South Dakota State and a CSCCa board member, reports to a senior associate athletics director. And while he regularly interacts with the school’s coaching and sports medicine staffs, he does not have to seek their approval before proceeding with a workout.

His primary focus is developing strength and power, enhancing speed and agility, and making athletes more injury resistant. Mental toughness, he insists, is a mere byproduct of adhering to a meticulously designed workout program. The best way to foster a safe approach? Moe thinks it’s essential for strength and conditioning coaches to be hired by and report to a senior administrator, not a sport coach.

“Unfortunately, many sport coaches only want the yeller and screamer, or someone who looks the part but may not have the necessary training or knowledge,” Moe says. “Many people and sport coaches think if it makes them sweaty and tired, or makes them puke, then it is good. But training is not about one workout, but about a planned progression of workouts and adaptation over time.”

But the traditional structure, in which strength coaches report directly to sport coaches, remains common in the highest-profile sports, such as major Division I football.

Stacey Torman, director of athletic performance for Olympic sports at the University of Alabama at Birmingham, has been with the school for nearly three decades. Such career stability in Division I, she says, is more common for coaches like her who deal with sports other than football and basketball.

At UAB, for instance, she reports to an athletics administrator; the strength and conditioning coaches for football have a separate staff with their own weight room.

They maintain relatively little contact with the veteran Torman, a CSCCa board member. She says that setup seems common across other campuses throughout the division—and is even spreading to basketball. Altering arrangements like those in Division I in the near future, Stiggins admits, seems unlikely.

Michael Massik, executive director of the NSCA, says he hopes to see more schools creating a third branch—often dubbed sports performance—that has touch points with sport coaching and the sports medicine staff, but is independent of both. Some colleges already have adopted the approach, where the performance branch is home to strength coaches, nutritionists and psychologists. Greg Haff, NSCA president and a strength coach who has worked in the United States and Australia and has done consulting...
work in the United Kingdom, says such arrangements are increasingly common outside the United States.

"We're seeing it more on the pro teams because they are not as necessarily constrained by budget as some of the collegiate programs," Massik says. "We do believe that it's going to filter down, and if you asked me what my view of the future is, that's the future. It's logical."

In 2012, representatives from a dozen prominent sports medicine and sports science organizations put forward a best-practices document for limiting sudden death in conditioning sessions. With Casa and Anderson as the document's lead authors, it decried conditioning as punishment and offered guidance for proper acclimatization, credentialing standards, reporting structure and developing emergency action plans. It remains the most comprehensive paper of its kind.

The document was discussed at NCAA Committee on Competitive Safeguards and Medical Aspects of Sports meetings. Elements of the paper went on to inform safety-centric legislative proposals, but the committee never formally endorsed the document.

Subsequently, it has lacked influence.

The NCAA, CSCCa and NSCA hope they are on the path to rectifying that by building on the 2012 paper with the guidelines the groups are crafting for conditioning sessions—particularly focusing on the ever-dangerous transition periods. The work is the fruit of the summer meeting held at the NCAA national office and a stop Casa and Anderson say is long overdue.

"It doesn't have to be a bylaw; all it has to be is a standard," Anderson says. "OK, you violated the standard of practice ... your job is at stake."

Stiggins feels the forthcoming release of an agreed-upon best practices document (in the vein of previously released interassociation documents) to NCAA members could be a landmark moment for the field. But the groups disagree on how the guidelines become athletics department gospel: Are standards of care, similar to those prescribed for athletic trainers, enough? What penalties should be imposed? Should coaches be at risk of losing their credential?

For now, consequences for negligence remain inconsistent—the credentialing groups, for instance, say they have rarely found cause to pull a credential. But the NCAA's acknowledgment of sound guidelines, along with consensus from other leading medical groups, could be critical.

"Even if it's not passed as policy, if (the NCAA) were to release that as best practices or recommendations, that would put a huge burden on the schools to consider those items," Casa says.

The NCAA Sport Science Institute already has begun a more direct approach. In January, a Nebraska conditioning session left a pair of football players hospitalized for several days with exertional rhabdomyolysis. Nebraska's new coach, Scott Frost, insisted his strength coach had tampered down the intensity of his workouts given that the student-athletes were returning from a holiday break, but Frost accepted responsibility for what transpired (though received no public censure from the school). Within days of the incident, Hainline sent a note to coaches, athletic trainers, athletics directors and other administrators throughout the NCAA membership with detailed information about exertional rhabdomyolysis and how to prevent it.

The strength and conditioning field also has begun leaning on advanced data and analytics to guide decision-making and stave off incidents like what occurred at Nebraska. Haff says the United States has been slower to adopt such evolutions, which he says are commonplace overseas. While the amount of weight someone can lift or the duration of conditioning exercises they've been subjected to can be cataloged easily, Haff says relying on mechanisms—such as heart rate monitors and GPS technology that tracks distance, pace and recovery—to gauge the internal load is emerging as another tool to foster safer environments.

For all the data's benefits, Haff warns that the statistics may make strength coaches overly cautious. If they don't push athletes to the place where they can make steady gains and adaptations, making them ill-prepared for the rigors of competition, injury rates can spike. He has seen that problem manifest while working with athletes in Australia.

Still, among some college programs that have begun integrating technology and data, the decision has had a net positive effect as strength and conditioning coaches begin to weigh both statistics and intuition—much as clinicians do—to guide their decisions. "Some of this technology stuff ... has got the coaches to inherently understand and listen to what strength and conditioning coaches and athletic trainers have been telling them for years," says Cohen, the Arizona medical services director. "'We're wearing these guys out.' And now you have numbers, and coaches, finally, some of them will look at that and say, 'Wow.'"

The potential solutions are many: comprehensive guidelines, a detailed registry to augment hiring practices, amended reporting structures, increased transparency and documentation of workouts, and integration of data and technology. They inevitably will vary in their efficacy and impact. But in lieu of the field coming together under one umbrella, the way athletic trainers did three decades ago, this piecemeal approach may be the best recourse in the near future. Perhaps, taken together, these incremental changes will yield positive outcomes.

Only fewer deaths, fewer injuries, fewer headlines highlighting ugly exertional rhabdomyolysis incidents will demonstrate whether those approaches are enough to mitigate the risks. Only those metrics will determine if the many steps promised in the coming months and years can conquer an archaic culture and help young athletes' bodies and minds grow stronger during difficult workouts, not succumb to them.

Hainline, for one, is hopeful: "I do see that change is happening, and I think others are seeing the necessity for that. We've already passed the immovable place."

"It's like the Wild, Wild West," says Douglas Casa, chief executive of UConn's Korey Stringer Institute, a research and advocacy group devoted to preventing sudden death in sport.
HEATT Innovation Technology Summit at UConn's KSI
Promoting performance and safety for athletes, warfighters, & laborers

October 17-18th, 2019    Location: UConn Campus Storrs, CT

Registration available April 2019
www.ksi.uconn.edu

The purpose of this summit is to unite individuals within industry and research settings to provide the most up-to-date, accurate information for the attendees and enhance the technology associated with hydration and environmental monitoring.

Hosting at the Korey Stringer Institute allows for integration within the state of the art laboratory and collaboration with on-site experts.

The mission of the Korey Stringer Institute is to provide research, education, advocacy and consultation to maximize performance, optimize safety and prevent sudden death for the athlete, warfighter and laborer.
Can you tell us about yourself?

I spent most of my teen years growing up in Colorado, after living in Indiana and Illinois during my childhood. Then the surging construction business brought my family to Florida and I am still here 30 years later. Although I still consider Colorado "home", the absence of the extreme winters I grew up with is convincing reason to stay. In 2006, I decided that a college education would be essential to my career growth and salary potential and earned a Bachelor of Science in Health Sciences in 2010. During those 4 years of studies, I was a single mother of two children and working a full-time at a law firm. I would be remiss if I didn’t mention here that without the support of a few very special people, this achievement would have been a great deal more difficult for me and I am so grateful for them.

I am currently the President and Co-founder of Zach Martin Memorial Foundation & Heat Stroke Prevention, Inc. The Foundation was created after my 16-year-old son, Zach Martin, died from Exertional Heat Stroke (EHS) suffered at one of his high school summer conditioning sessions in 2017. He collapsed at the end of an especially difficult workout on June 29th and fought hard to stay with us until his body just couldn't do it anymore. He died July 10, 2017. After Zach's death, I began researching Exertional Heat Illness (EHI) and Exertional Heat Stroke trying to make sense of what happened. I was devastated to discover that prevention and treatment are so simple, yet they were not a requirement for certification as a high school coach in Florida. Based on this information, I knew I had to reach beyond my grief to do something. Deaths from EHS were occurring with some regularity; I knew I would not be able to live with myself if it happened again and I had done nothing to protect other kids and families. My husband and I weren't sure exactly what we could do, but we believed that by creating the Foundation, others would benefit. Since starting the Zach Martin Memorial Foundation, we have donated large cold-water immersion tubs to several high schools who had none. My husband and I have spoken at club sports meetings about athlete safety, creating policies and emergency action plans specific to their sport, and self-monitoring of weight and hydration for the players. The Foundation also started a scholarship fund to benefit AT students at Florida Universities. This year, we are also working on elementary and middle school exertional heat illness curriculum for consideration by the local school board. This learning system is based on the idea that safety learned at a young age is easier to recall as an adult. Do you remember the first time you were shown the Heimlich Maneuver or Stop, Drop and Roll? I don't specifically remember someone teaching me either of these, but I know them.

Could you tell us about your first involvement/interaction with the Korey Stringer Institute?

Our first method of outreach through the Foundation was contacting the Florida High School Athletic Associated (FHSAA). They gave us contact information for Bob Sefcik, ATC, LAT, of the Jacksonville Sports Medicine Program. We spoke with Bob several times through the end of 2017 and early 2018 about our desire to influence better safety policies at Florida high schools. In the Spring of 2018, Bob invited me and my husband to share Zach's story at the Florida Alliance for Sports Medicine (FASMed) Collaborative Solutions meeting and participate in discussions about current FHSAA policies. Dr. Casa was there to share the ATLAS study results and areas the State of Florida and FHSAA specifically needed to address regarding athlete safety. All attendees were assigned specific areas of concern to address through group discussion and writing updated or new policies for review and I was assigned to the heat illness group led by Dr. Casa. His wealth of knowledge about heat illnesses, prevention, and treatment, in conjunction with his open discussion style and patience explaining details led the discussion to very clear policy suggestions. After the meeting, Dr. Casa gave me additional printed information on Exertional Heat Illness and Korey Stringer Institute, and they are valuable resources for me to use as I teach others.

In what ways has KSI impacted you?

KSI has made a very real difference in the way I and my Directors function as principles of Zach Martin Memorial Foundation. We are learning to teach individuals and groups prevention and treatment of EHI and EHS and we see implementation of these practices materializing quicker because they understand how to prepare, what to look for, and how to respond to save someone’s life. We believe it is important for everyone to know about EHI and EHS and the steps to cooling immediately.

In 2018, we became acquainted with Jim Mackie, M.Ed., ATC, LAT, of Jacksonville Sports Medicine Program and Mike Ryan, PT, ATC, CES, PES, of Mike Ryan Sports Medicine. They collaborated on a project with the Foundation, and Dr. Casa and KSI to provide an easy to understand learning tool available to athletes, parents, coaches, etc. who have no medical training and may not understand the urgency for immediate intervention. The Directors of Zach Martin Memorial Foundation voted unanimously to fund and produce "Cold Water Therapy Guide to Heat Illness", a video which was nationally released at SEATA the beginning of March 2019 and is available to view on our website www.zachmartinfoundation.com. It portrays some recognizable signs of EHI and EHS, explains what is happening to the person's body, and demonstrates two of the best ways to begin cooling them quickly; cold water immersion using a large tub and the "Taco Method". Most importantly, the video stresses the importance of "Cool first, transport second". The encouragement and support we received for this project from Jim, Mike, and Dr. Casa and KSI has increased recognition of our video by many Athletic Trainers as a training and education ool they recommend to high school coaches and administration in the event of EHI and EHS. I feel fortunate to meet and work with so many good people in the last two years. Each of them is passionate about protecting others and active in sharing wisdom and teaching others how to do the same. I am learning so much from them and appreciate their continued patience and unwavering support of our work through the Zach Martin Memorial Foundation.
PHOTOS OF KOREY STRINGER INSTITUTE STAFF AND FRIENDS

MAKING SPORTS SAFER
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