TEAM UP FOR SPORTS SAFETY TUFSS

KSI Korey Stringer Institute | SUPPORTED BY NATA

TUFSS 2021
New Hampshire

Rebecca L Stearns, PhD, ATC

COO, Korey Stringer Institute
Assistant Professor, University of Connecticut

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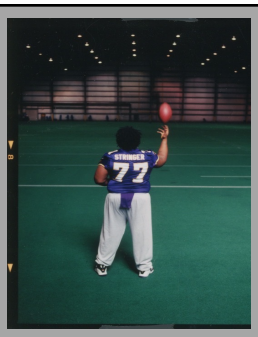
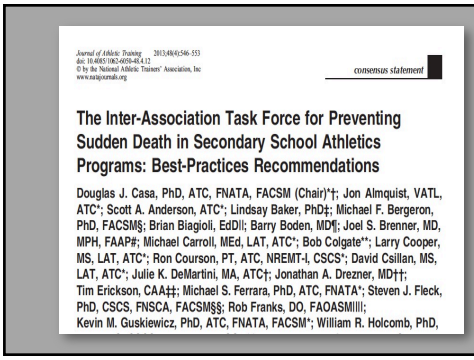


- August 1, 2001

The only NFL player to die as a result of a practice or game.

2



Journal of Athletic Training 2013;48(4):546–553
doi: 10.4085/1062-6050-48.4.12
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consensus statement

The Inter-Association Task Force for Preventing Sudden Death in Secondary School Athletics Programs: Best-Practices Recommendations

Douglas J. Casa, PhD, ATC, FNATA, FACSM (Chair)*†; Jon Almquist, VATL, ATC*; Scott A. Anderson, ATC*; Lindsay Baker, PhD‡; Michael F. Bergeron, PhD, FACSM§; Brian Biagioli, EdD‖; Barry Boden, MD¶; Joel S. Brenner, MD, MPH, FAAP#; Michael Carroll, MEd, LAT, ATC*; Bob Colgate**; Larry Cooper, MS, LAT, ATC*; Ron Courson, PT, ATC, NREMT-I, CSCS*; David Csillan, MS, LAT, ATC*; Julie K. DeMartini, MA, ATC†; Jonathan A. Drezner, MD††; Tim Erickson, CAA‡‡; Michael S. Ferrara, PhD, ATC, FNATA*; Steven J. Fleck, PhD, CSCS, FNSCA, FACSM§§; Rob Franks, DO, FAOASM‖‖; Kevin M. Guskiewicz, PhD, ATC, FNATA, FACSM*; William R. Holcomb, PhD,

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Endorsed By

- NFHS
- AMSSM
- AOSSM
- AOASM
- CATA
- GSSI
- KSI
- NATA
- NCCSIR
- NCSF
- ACSM
- NIAAA
- NSCA
- GFELLAR

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Top causes of sudden death in athletes

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Top Causes of Sudden Death in Athletes

1. Cardiac
   - Congenital
   - Heart Disease
   - Commotio Cordis
2. Exertional Heat Stroke
3. Traumatic Brain Injuries
4. Cervical Spine
5. Exertional Sickling
6. Traumatic Injuries
7. Lightning
8. Asthma
9. Exertional Hyponatremia
10. Anaphylactic Shock, hypothermia, diabetes etc

Casa DJ, Guskiewicz KM, Anderson SA, et al. National Athletic Trainers' Association Position Statement: Preventing sudden death in sports. *Journal of athletic training*. 2012;47(1):96-118.

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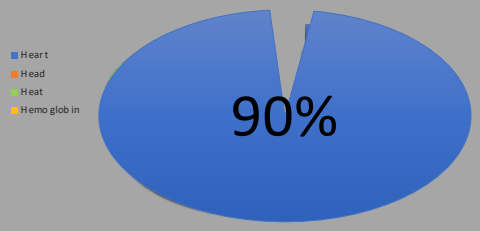
Top Causes of Sport-Related Death



The 4 H's (5 H's- Hyponatremia)

7

Adams, W. M., Scarneo, S. E., & Casa, D. J. (2017). State-level implementation of health and safety policies to prevent sudden death and catastrophic injuries within secondary school athletics. *Orthopaedic Journal of Sports Medicine*, *5*(9), 232596711772726 2.

Original Research

State-Level Implementation of Health and Safety Policies to Prevent Sudden Death and Catastrophic Injuries Within Secondary School Athletics

William M. Adams,* PhD, ATC, Samantha E. Scarneo,* MS, ATC, and Douglas J. Casa,*† PhD, ATC, FNAK, FACSM, FNATA

Investigation performed at the Korey Stringer Institute, Department of Kinesiology, University of Connecticut, Storrs, Connecticut, USA

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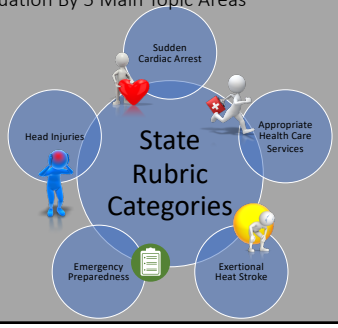
Policy Evaluation By 5 Main Topic Areas



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TUFSS Mission

The goal of TUFSS is to propel adoption of policies proven to reduce the incidence of catastrophic sport injuries for secondary school athletes.

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Thank you to our Sponsors!

NATA NATIONAL ATHLETIC TRAINERS' ASSOCIATION

NFL

...and the hundreds of private donors!

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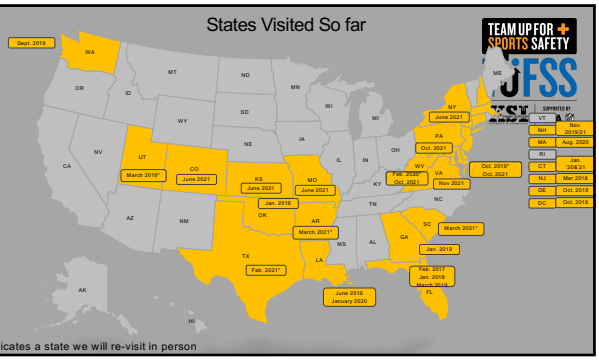
States Visited So far



* Indicates a state we will re-visit in person

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Emergency Action Plans For Every School

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High School SCD Outcomes

- 1 in 70 high schools will have SCA on campus, almost half in athletes
- Over 85% survivable if:
  1. Witnessed
  2. EAP established and
  3. AED promptly applied
- EAP improves survival rate by 35%
- 34% of coaches practice EAP when 72% are trained in AED use

Drezner JA, Toresdahl BG, Rao AL, Huszti E, Harmon KG. Outcomes from sudden cardiac arrest in US high schools: a 2-year prospective study from the National Registry for AED Use in Sports. Br J Sports Med. 2013 Dec;47(18):1179-83.

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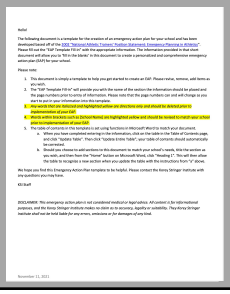
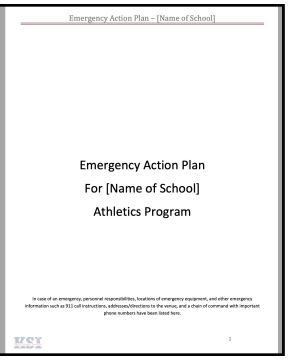
Implementation





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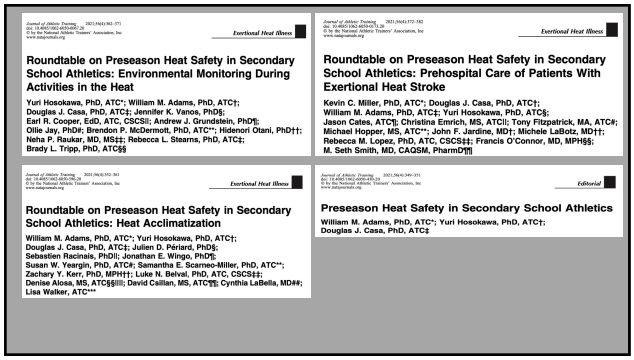

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Heat Acclimatization Plan For Every School

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Heat Acclimatization

Area of Practice Modification	Practices 1-5		Practices 6-14
	Days 1-2	Days 3-5	
# of Practices Permitted Per Day	1		2, only every other day
Equipment	Helmets only	Helmets & Shoulder Pads	Full Equipment
Maximum Duration of Single Practice Session	3 hours		3 hours (a total maximum of 5 hours on double session days)
Permitted Walk Through Time (not included as practice time)	1 hour (but must be separated from practice for 3 continuous hours)		
Contact	No Contact	Contact only with blocking sleds/dummies	Full, 100% live contact drills

NOTE: warm-up, stretching, cool-down, conditioning, and weight-room activities are included as part of practice time

Secondary School Guidelines

Preseason Heat-Acclimatization Guidelines for Secondary School Athletics. Journal of Athletic Training. 2009;44(3):332-333.

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The Association between Mandated Preseason Heat Acclimatization Guidelines and Exertional Heat Illness during Preseason High School American Football Practices

Zachary Y. Kerr,[1] Johna K. Register-Mihalik,[2] Riana R. Pryor,[2] Lauren A. Pierpoint,[3] Samantha E. Scarneo,[4] William M. Adams,[5] Kristen L. Kucera,[1] Douglas J. Casa,[4] and Stephen W. Marshall[6]

[1]Department of Exercise and Sport Science, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA
[2]Department of Exercise and Nutrition Sciences, University at Buffalo, State University of New York, Buffalo, New York, USA
[3]Department of Epidemiology, University of Colorado Anschutz, Aurora, Colorado, USA
[4]Korey Stringer Institute, Department of Kinesiology, University of Connecticut, Storrs, Connecticut, USA
[5]Department of Kinesiology, University of North Carolina at Greensboro, Greensboro, North Carolina, USA
[6]Department of Epidemiology, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA

Environmental Health Perspectives 047003-1 127(4) April 2019

Conclusions

The risk of heat-related illness and death is likely to increase in many locations as a consequence of climate change (Pachauri et al. 2014), and effective policies are needed to protect populations from adverse effects of excessive heat. The present study, in combination with other biological, epidemiologic, and clinical evidence, supports the effectiveness of NATA-IATF guidelines in reducing EHI rates among American high school football players. State high school athletic association–mandated heat acclimatization guidelines that met the NATA-IATF recommendations were associated with a 55% reduction in the incidence of EHI. Based on our findings, we recommend that state high school athletic associations consider mandating NATA-IATF guidelines for their high schools. However, future studies should continue to monitor trends in EHI rates while examining their hypothesized association with NATA-IATF guideline mandates. Evaluative research should also aim to identify factors that facilitate and impede implementation and adoption of the NATA-IATF guidelines as well as other public health guidelines and policies to reduce the adverse health effects of ambient heat.

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Implementation

Sample Exertional Heat Illness Policy & Procedures

Policy Area: Environmental Safety	**Subject:** Exertional Heat Illness
Title of Policy: Exertional Heat Illness	**Number:** (This is a numbering system used by the organization)
Effective Date: (Date policy is to be implemented)	**Page Number:** (x of x)
Approved Date: (Date when policy was approved)	**Approved By:** (This area may contain a routing list of individuals who must review and approve)
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I. **Purpose of policy:**

Exertional heat illness includes exercise-associated muscle cramps, heat syncope, heat exhaustion, and exertional heat stroke (EHS). Current best practice guidelines suggest that the risk of exertional heat injuries can be minimized with heat acclimatization and diligent attention to monitoring individuals participating in activities that place them at a higher risk for these types of injuries.[1] In the event an athlete sustains a heat illness, immediate and proper treatment is needed.

National governing bodies, such as the National Federations of High School Associations, National Collegiate Athletic Association (NCAA) and numerous state athletic/activity associations, have published guidelines for the prevention, monitoring and treatment of exertional heat illnesses. In addition, national authorities such as the National Athletic Trainers' Association and the Korey Stringer Institute have published research to support best practices in this area. The development of the organization's heat acclimatization guidelines will be based on the current best practice documents.

[1]Casa DJ, Demartini JK, Bergeron MF, et al. National Athletic Trainers' Association Position Statement: Exertional Heat Illnesses. *Journal of Athletic Training*. 2015;50(9):986-1000.

II. **Policy statement:**

This policy describes the best practice procedures for the prevention, monitoring, and when necessary, the treatment of exertional heat illnesses for students/athletes, faculty and staff of **[Organization Name]**.

This policy will be a living, working document, that is continually reviewed and updated yearly as the organization and our community changes.

III. **Definitions:**

- *Acclimatization* – The process of gradually increasing the intensity of activity in a progressive manner that improves the body's ability to adapt to and tolerate exercise in the heat.
- *Wet Bulb Globe Temperature* – The WBGT is a measurement tool that uses ambient temperature, relative humidity, wind, and solar radiation from the sun to get a comprehensive measure that can be used to monitor environmental conditions during exercise. WBGT is different than heat index, as it is a more comprehensive measurement of environmental heat stress on the body.
- *Non-Practice Activities* – Activities that include meetings, injury treatment, and film study.
- *Practice* – the period of time that a student-athlete engages in coach-supervised, school approved sport or

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WBGT Based Exercise Modifications For Every School

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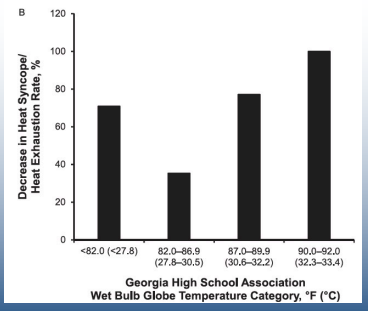
A WBGT Policy Reduces Heat Illness Rates by 35-100% in Warm & Hot Temperatures



Cooper ER et al. Heat policy revision for Georgia high school football practices based on data driven research. *JAT. 2020*

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Cat 3	Cat 2	Cat 1	Activity Guidelines
< 82.0°F <27.8°C	< 79.7°F <26.5°C	< 76.1°F <24.5°C	Normal Activities – Provide at least three separate rest breaks each hour with a minimum duration of 3 min each during the workout.
82.2 - 86.9°F 27.9-30.5°C	79.9 - 84.6°F 26.6-29.2°C	76.3 - 81.0°F 24.6-27.2°C	Use discretion for intense or prolonged exercise; Provide at least three separate rest breaks each hour with a minimum duration of 4 min each.
87.1 - 90.0°F 30.6-32.2°C	84.7 - 87.6°F 29.3-30.9°C	81.1 - 84.0°F 27.3-28.9°C	Maximum practice time is 2 h. For Football: players are restricted to helmet, shoulder pads, and shorts during practice. If the WBGT rises to this level during practice, players may continue to work out wearing football pants without changing to shorts. For All Sports: Provide at least four separate rest breaks each hour with a minimum duration of 4 min each.
90.1 - 91.9°F 32.2-33.3°C	87.8 - 89.6°F 31.0-32.0°C	84.2 - 86.0°F 29.0-30.0°C	Maximum practice time is 1 h. For Football: No protective equipment may be worn during practice, and there may be no conditioning activities. For All Sports: There must be 20 min of rest breaks distributed throughout the hour of practice.
≥ 92.1°F ≥ 33.4°C	≥ 89.8°F ≥32.1°C	≥ 86.2°F ≥30.1°C	No outdoor workouts. Delay practice until a cooler WBGT is reached.

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Equipment

- Kestrel WBGT: $399
- Others:
  - Extech
  - Reed

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EHS Treatment Policy For Every School

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Steps to Survival

- Rapid Recognition
- Rapid Assessment
- Rapid Cooling
- Rapid Advanced Care

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The Most Important Thing To Remember

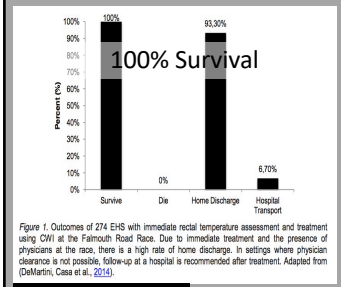

Figure 1. Outcomes of 274 EHS with immediate rectal temperature assessment and treatment using CWI at the Falmouth Road Race. Due to immediate treatment and the presence of physicians at the race, there is a high rate of home discharge. In settings where physician clearance is not possible, follow-up at a hospital is recommended after treatment. Adapted from (DeMartini, Casa et al., 2014).

DeMartini, Casa, et al. MSSE, 2014

Increased organ dysfunction, morbidity, and mortality after 30 minutes of extreme hyperthermia

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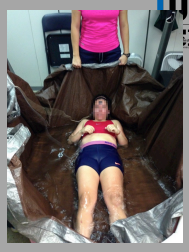
Alternative Methods



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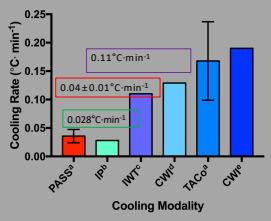
Tarp Assisted Cooling (TACo) Method



- **Figure.** Comparison of cooling rates with previously published cooling modalities.
- *Passive rest (PASS[a])* 0.04±0.01°C·min⁻¹
- *ice packs at major arteries (IP[b])* 0.028°C·min⁻¹
- *ice-wet towels (IWT[c])* 0.11°C·min⁻¹
- *cold water immersion, 7°C (CWI[d])* 0.129°C·min⁻¹
- *tarp assisted cooling method, (TACo[e])* 0.17±0.07°C·min⁻¹
- *CWI,* 0.19°C·min⁻¹

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Types of Devices

Continuous Measurement

DataTherm

Allows for flexible thermistor

~$250-400

Singular measurements

Welch Allyn

Rigid probe, not easily (or at all) able to find flexible thermistors

~$200

Regular Thermometer

~6

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Equivalent Life-saving Tools

AED = Rectal thermometer

- AED analyzes heart rhythm
  - Rectal thermometer analyzes body temperature
- AED confirms cardiac diagnosis
  - Rectal thermometer confirms heat stroke diagnosis
- AED determines when to deliver shock, how many are needed, and when normal heart rhythm returns
  - Rectal thermometer determines when temperature returns to safe limits, when cooling is ceased
- Removing AED too early = insufficient treatment
  - Removing cooling too early (because no temperature known) = insufficient treatment

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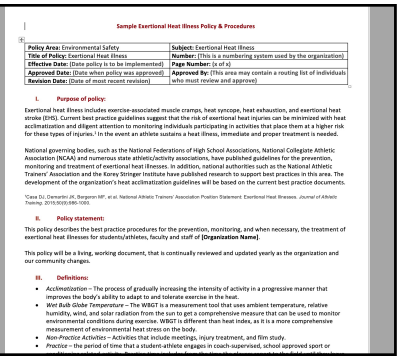
Implementation

Also include language for hydration plan



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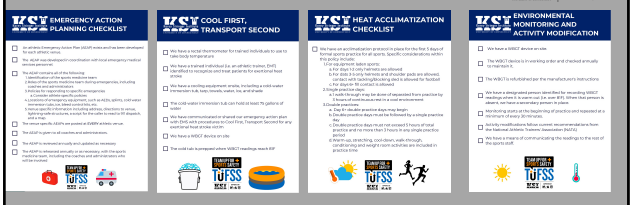
Is our policy compliant?



Hydration and PPE plans too!

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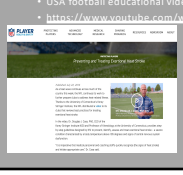
Education

- NFL EHS educational video (12 min)
- https://www.playsmartplaysafe.com/newsroom/videos/preventing-treating-exertional-heat-stroke/
- TedEd Heat Stroke video (4min):
- https://www.youtube.com/watch?v=PnHM4Df9ZQU
- USA football educational video:
- https://www.youtube.com/watch?v=DTwuHEXWVw0



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Thank you!

Rebecca.Stearns@uconn.edu

KSI.uconn.edu

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KSI Website

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