Nontraumatic Exertional Fatalities in Football Players, Part 1: Response

Authors’ Response:

We are grateful for the interest in “Nontraumatic Exertional Fatalities in Football Players, Part 1.”1,2 We agree this manuscript provides critical data to inform action-oriented policies and procedures to mitigate risk of catastrophic injuries and fatalities. Additionally, the data should spur governing bodies to action, preventing these tragic deaths.

The NCAA 2003 football out-of-season model became the point of demarcation as, (1) it was crafted in response to nontraumatic NCAA football training deaths, and (2) it is legislation designed to minimize health and safety risks via prescribed structure for preseason football practices and out-of-season training. A 5-day acclimatization period is the hallmark of the 2003 model. Although its genesis is NCAA, the 5-day acclimatization has been embraced as a component guideline for safe and effective preseason high school football practice.3

EHS remains a significant issue for collegiate, high school, and youth football owing to unsafe conditioning practices. Since 2009 there have been 19 high school football-related EHS deaths and 16 since 2011. The year 2020 has proven perilous for high school football players, as there have been 6 nontraumatic exertional fatalities as of this writing. EHS is identified in 3, the cause is as yet undetermined in 3. Whether counting from 1998 or 2011, 2 EHS deaths per year is the average.

Prevention of EHS hinges on knowledge of causation. Our belief is that excessive intensity in exertion is serially ignored or undervalued.3,5 The context of exertion-related nontraumatic fatality is clearly demonstrated in our 20-year retrospective, year-round, cumulative review inclusive of the preseason, in season, and out of season.3 Part 2 of our study includes multiple descriptions and case examples.3 The context for cardiac, exertional sickling, asthma, and EHS fatality is intensity.

EHS causation, intensity of exertion, is wholly within the control of the stewards of sport. EHS is exertional more than environmental.3,5 Although environmental heat load is a factor, primary in EHS is a thermoregulatory system overwhelmed because of excessive metabolic heat production with intense physical activity. In our study, EHS more often manifested in the absence of extreme environmental conditions. Linemen were the main at-risk population. The prevention paradigm must shift from a focus on football uniform, dehydration, and an excess focus on environment to how these sessions are structured, managed, and regulated.3 All EHS fatal collapses occurred during high-intensity aerobic training in a conditioning workout or a practice with a conditioning session.3 None occurred in a game.5 Every victim but 1 was a lineman.3 Coaches must become accountable for causation in their “orthodox” practices, some of which are unscientific and unsafe.

These tragic exertional deaths will never be eradicated by merely managing symptoms upon presentation. James Moriarity, MD, past president of the American Medical Society for Sports Medicine stated, “I support the broad concept of having better fire trucks; but I would champion even more that we do not have houses made of straw. And I truly believe that football conditioning, or what passes for football conditioning in this country, is a house of straw. Conditioning as practiced in many high schools and colleges, including elite college programs, is antiquated, scientifically unstudied, and can be (obviously) dangerous.”1 Independent medical care must be a foundational principle in sport, but medical oversight is not the salvation for poor workout design; an athletic trainer cannot make the unsafe safe.

Absent change, nothing changes. EHS fatality in football continues, even in states adopting EHS preventative guidelines. The tragic, preventable exertional deaths of athletes will continue until we adjust training for sport based on understanding who is at risk and who is at fault.

Scott A. Anderson, BA, ATC
Norman, Oklahoma, USA
Kenneth M. Fine, MD
Ilan Breit, PA-C
Rockville, Maryland, USA
Tiahna A. Spencer, MD
Farmington, Connecticut, USA
Wendee Lentz, PhD, ATC
Norman, Oklahoma, USA
Barry P. Boden, MD
Rockville, Maryland, USA

Address correspondence to Barry P. Boden, MD (email: bboden@starpower.net).

One of more of the authors has declared the following potential conflict of interest or source of funding: K.M.F. has received honoraria and consulting fees from Flexion Therapeutics and education payments from Supreme Orthopedic Systems. AOSSM checks author disclosures against the Open Payments Database (OPD). AOSSM has not conducted an independent investigation on the OPD and disclaims any liability or responsibility relating thereto.

REFERENCES

1. Anderson SA. The Junction Boys syndrome. J Strength Cond Res. 2012;26(5):1179-1180.
2. Boden BP, Fine KM, Breit I, Lentz W, Anderson SA. Nontraumatic exertional fatalities in football players, part 1: epidemiology and
effectiveness of National Collegiate Athletic Association bylaws. 
*Orthop J Sports Med.* 2020;8(8):2325967120942490.

3. Boden BP, Fine KM, Spencer TA, Breit I, Anderson SA. Nontraumatic exertional fatalities in football players, part 2: excess in conditioning kills. *Orthop J Sports Med.* 2020;8(8):2325967120943491.

4. Casa DJ, Csillan D, Armstrong LE, et al. Preseason heat-acclimatization guidelines for secondary school athletics. *J Athl Train.* 2009;44(3):332-333.

5. Epstein Y, Moran DS, Shapiro Y, Sohar E, Shemer J. Exertional heat stroke: a case series. *Med Sci Sports Exerc.* 1999;31(2):224-228.