

NATA TASK FORCE: PREVENTING EXERTIONAL HEAT STROKE DEATH IN AMERICAN FOOTBALL LINEMEN

Executive Summary

Exertional heat stroke (EHS) remains one of the leading causes of sudden death in sport, with a disproportionate and persistent burden among American football linemen, who account for the vast majority of EHS fatalities at the secondary school and collegiate levels.

This Task Force document was developed to address this critical and preventable health issue by synthesizing current evidence and generating consensus-driven, position-specific recommendations to reduce EHS risk in linemen. Using a Delphi methodology, a multidisciplinary panel produced 20 actionable recommendations spanning education, training design, administration, and emergency preparedness.

Conceptual Framework

Position-Specific Risk Profile

EHS risk in football is not uniform. Linemen face unique physiological and contextual vulnerabilities, including larger body mass, lower aerobic fitness, greater metabolic heat production, and reduced cooling efficiency. These factors are often compounded by non-optimized conditioning practices that fail to reflect position-specific demands.

Training Environment and System Factors

Most EHS events occur outside of competition, during conditioning sessions, where training structure, supervision, and policy implementation are key determinants of safety. Accordingly, prevention requires system-level approaches—including coach education, institutional accountability, and adherence to evidence-based best practices—rather than reliance on clinical response alone.

Prevention–Recognition–Response Continuum

Effective EHS mitigation depends on:

- Prevention (safe training design, acclimatization, environmental monitoring)
- Early recognition (educated staff, symptom awareness)
- Rapid on-site treatment (immediate cooling prior to transport)

These interconnected components are essential to improving survival and reducing morbidity.

Topline Recommendations by Domain

Education and Professional Standards

- Mandatory EHS education: All sport coaches and strength & conditioning (S&C) personnel should complete initial and recurring (≤ 2 years) training on EHS prevention, recognition, and treatment.
- Establish qualified staffing: Programs should employ appropriately credentialed S&C professionals and ensure adherence to established professional standards.
- Promote shared competency, rehearsal and simulation of emergencies: Coaches, S&C staff, and medical personnel must demonstrate working knowledge of EHS risk factors and emergency care procedures.

Training Design and Transition Periods

- Implement defined transition periods: The first 5 days of any return to training should include gradual, progressive workload increases to account for deconditioning and heat risk.
- Avoid high-intensity testing early: Aerobic or repeated high-intensity conditioning tests should not occur during initial transition days (5–7 days).
- Use structured progression models: Apply frameworks such as the 50/30/20/10 rule and FIT principles to safely scale intensity and volume.

Position-Specific Conditioning

- Individualize training for linemen: Conditioning programs must reflect linemen's physiological demands, including tailored work-to-rest ratios and workload prescriptions.
- Avoid uniform team conditioning: Training should not treat linemen like other position groups, as this increases EHS risk.

Environmental Monitoring and Practice Modification

- Use WBGT-based decision-making: Activity modifications must be guided by on-site wet bulb globe temperature (WBGT) measurements and regional thresholds.
- Sustain monitoring during high-risk periods: Environmental monitoring should continue until sustained low-risk conditions are established.

Emergency Preparedness and Treatment

- Ensure on-site cooling capability: Effective cooling modalities (e.g., cold-water immersion) must be immediately available at all practices and conditioning sessions.

- Prioritize “cool first, transport second”: Rapid on-site cooling prior to EMS transport is essential for survival.
- Coordinate with emergency services: Programs, especially without on-site medical personnel, should establish formalized EHS action plans with EMS before the season.

Administrative Oversight and Safety Culture

- Pre-plan and document workouts: Training sessions should be designed in advance and not exceed intended volume or intensity.
- Eliminate punitive conditioning: Exercise must not be used for punishment, coercion, or evaluation of “mental toughness,” as these practices are strongly associated with EHS events.
- Discourage unsafe weight-control behaviors: Programs should actively prohibit dehydration or unsafe body composition practices.

Surveillance and Accountability

- Strengthen reporting systems: Catastrophic events should be systematically reported (e.g., to the NCCSIR) to improve surveillance and inform future prevention efforts.
- Align policies with evidence-based standards: Institutional adoption and enforcement of best practices are critical to reducing preventable deaths.

Summary

The elevated risk of exertional heat stroke among football linemen is well-established, preventable, and driven by modifiable factors, particularly unsafe or non-specific conditioning practices.

This Task Force emphasizes that effective prevention requires a shift toward position-specific training, structured acclimatization, environmental safeguards, and coordinated emergency response systems. When implemented collectively, these strategies provide a comprehensive framework to substantially reduce EHS incidence and fatalities in this high-risk population.

Athletic trainers, coaches, strength and conditioning professionals, and administrators all play critical roles in adopting and sustaining these evidence-informed practices to ensure athlete safety remains paramount.