



REGION 11 CHICAGO EMS SYSTEM PROTOCOL	Title: Exertional Heat Stroke – BLS/ALS
	Section: Toxins and Environmental
	Approved: EMS Medical Directors Consortium
	Effective: December 6, 2023

EXERTIONAL HEAT STROKE (EHS) – BLS/ALS

I. PATIENT CARE GOALS

1. For the patient with Exertional Heat Stroke (EHS) the goals of care include rapid recognition, rapid assessment, rapid cooling, and rapid advanced care.
2. Rapid cessation of and reversal of hyperthermia through whole body cooling.

II. PATIENT PRESENTATION

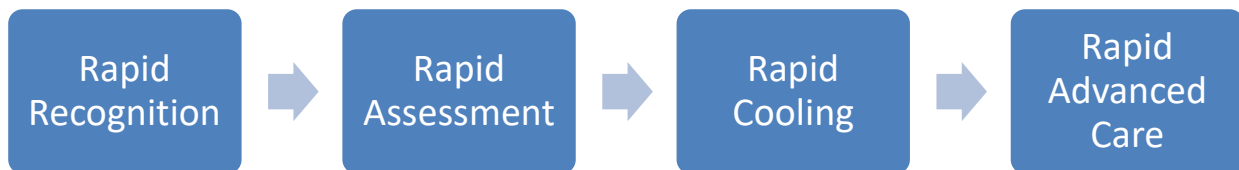
Exertional Heat Stroke (EHS) is an emergent hyperthermic condition that occurs in individuals performing physical activity, typically in warm, humid environments, but can also occur with exertion or impaired heat dissipation in cool environments.

A. Inclusion Criteria

1. Exertional Heat Stroke is characterized by both:
 - a. Severe hyperthermia (greater than 40.5 degrees C or 104.9 degrees F) AND
 - b. End organ dysfunction, which is typically manifested as central nervous system (CNS) dysfunction.

III. PATIENT MANAGEMENT

A. Approach to the Patient With Exertional Heat Stroke (EHS)



1. Rapid Recognition
 - a. Early recognition is critical to optimize treatment.
 - b. Dispatcher input may guide triage and treatment of a potential EHS patient.
 - c. EHS typically occurs in warm/humid environments in individuals performing strenuous and continuous exercise.
 - d. EHS may also occur in cool environments in individuals performing intense exercise.
 - e. Patients with EHS may present with CNS disturbances (confusion, irritability, or irrational behavior) which may progress to collapse or loss of consciousness.
 - f. Lack of sweating or hot skin are not always present in EHS.



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2. Rapid Assessment

- a. Mental status may range from mild disorientation to combative or comatose.
- b. Accurate measurement of internal core body temperature is necessary to determine EHS.
 - i. If available, rectal temperature (with insertion depth 15 cm) is the most accurate method.
 - ii. Rectal temperature is not within the EMS scope of practice in Region 11, but may be performed by other medical personnel on site.
 - iii. Surface temperature readings including oral, tympanic, axillary, and temporal have been shown to be invalid.
- c. If rectal temperature is not available or difficult to obtain, cooling should not be delayed in cases of suspected EHS.

B. Treatment and Interventions

1. Rapid Cooling

- a. Rapid cooling within 30 minutes of collapse is optimal.
- b. External cooling methods should adequately cool when applied to a sufficient body surface area.
- c. If available, cold water immersion (CWI) should be performed.
- d. If CWI is not available, use other cooling methods such as continuously and alternating placing cold wet towels over a patient's body.
- e. If seizure, treat per Seizure Protocol.
- f. If nausea and/or vomiting, treat per Nausea/Vomiting Protocol.

2. Rapid Advanced Care

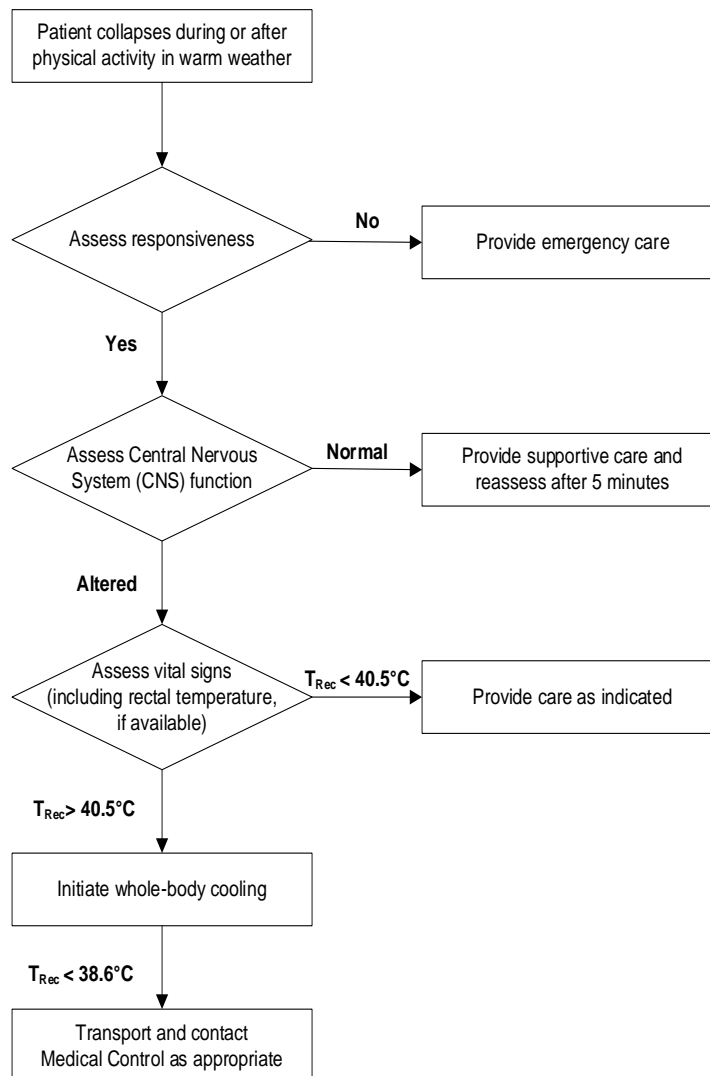
- a. For an EHS patient that is transported to the hospital – core temperature and mental status should be reassessed.
- b. Continued cooling and evaluation for end-organ damage may be needed in the hospital.



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TREATMENT OF EXERTIONAL HEAT STROKE





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C. Patient Safety Considerations

1. In situations where EHS is known or expected to occur, such as endurance/running races or sports practices, advanced planning is essential to ensure adequate staffing and access to the necessary supplies for cold water immersion (CWI) in order to allow for on-site cooling.
2. Regardless of the nature and locale of the EHS patient, the goal for treatment is to minimize the amount of time the individual is hyperthermic.
3. This underlies the principle “cool first, transport second”.
4. On site cooling may be in collaboration with other medical personnel at an event or sporting site.

IV. NOTES/EDUCATIONAL PEARLS

A. Key Considerations

1. A collapsed athlete should be assessed for other causes of altered mental status including cardiac arrhythmia, electrolyte abnormalities (hyponatremia/hyponatremia), hypoglycemia, stroke, trauma, or anaphylaxis.
2. Point of care blood testing may be available for electrolyte analysis.

B. Pertinent Assessment Findings

1. Early and repeat assessment of patient's mental status and core temperature are extremely useful in determining response to therapy and the need for additional treatment.
2. Identification of other causes of the collapsed athlete.
3. Time of symptom onset and time of initiation of any treatment.
4. Response to therapy.

References

Luke N. Belval, Douglas J. Casa, William M. Adams, George T. Chiampas, Jolie C. Holschen, Yuri Hosokawa, John Jardine, Shawn F. Kane, Michele Labotz, Renée S. Lemieux, Kyle B. McClaine, Nathaniel S. Nye, Francis G. O'Connor, Bryan Prine, Neha P. Raukar, Michael S. Smith & Rebecca L. Stearns (2018). Consensus Statement- Prehospital Care of Exertional Heat Stroke, *Prehospital Emergency Care*, 22:3, 392-397, DOI: 10.1080/10903127.2017.1392666.