



An Athlete's Guide to Exertional Heat Stroke

Exertional Heat Stroke (EHS) is a severe condition characterized by an extremely high core body temperature of above 40° C (104° F), central nervous system (CNS) dysfunction, and multiple organ system failure brought on by strenuous exercise, often occurring in the hot environments.

EHS is a medical emergency and can be a fatal condition if the individual's core body temperature remains above 40° C for an extended period of time without the proper treatment.

Signs and Symptoms of EHS:

- Core body temperature > 40° C
- Tachycardia (increased heart rate)
- Hypotension (low blood pressure)
- Sweating
- Hyperventilation
- Altered mental status (confusion/disorientation)
- Dizziness
- Irrational confusion
- Irritability
- Headache
- Inability to walk
- Loss of balance/muscle function
- Vomiting
- Diarrhea
- Collapse
- Seizures
- Coma

It is recommended when performing temperature assessment, **ONLY** a rectal temperature should be used with an overheated individual; it is the only method for an accurate and immediate temperature assessment if an ingestible thermometer was not used. Other temperature devices (tympanic, oral, skin or axillary) may give false readings.

Predisposing Factors:

Vigorous activity in hot-humid environment (usually lasting longer than 1 hour), lack of time to adapt to heat (acclimatization), poor physical fitness, dehydration, lack of sleep, fever or illness, warrior mentality, high pressure to perform and heavy equipment/uniform.

EHS is **NOT** limited to athletes exercising in hot weather. There have been many instances of EHS occurring in weather around 50° F. If someone is displaying signs of EHS, don't ignore them just because the weather isn't extremely hot or humid.

Treatment:

Rapid and aggressive whole-body cooling is the key to survival of exertional heat stroke

- The fastest way to decrease body temperature is to remove excess clothing and equipment and immerse the body into a pool or tub of cold water – cold water immersion – (35-59° F)
- The individual should be immersed within 30 minutes for optimal results and submerged until rectal temperature is below 38.3-38.9° C (101-102° F)
- After cooling, the individual should then be transported to a medical facility for monitoring of possible organ system damage



Return-to-Play:

Return to activity should be determined by a physician. Individuals should avoid exercise for a minimum of one (1) week after release from medical care. Individuals should start with a gradual return to activity under the supervision of a qualified health professional.

Prevention:

To prevent EHS, individuals should adapt to exercise in the heat gradually over 10-14 days (acclimatization) by progressively increasing duration and intensity of work, incorporate rest breaks, minimize amount of equipment/uniform worn in hot-humid weather, provide and encourage adequate fluid consumption.

What you can do:

- Know the difference between being tired and EHS symptoms
- Don't try to "push through" or "tough it out" when you're not feeling well, even if others are pressuring you (including yourself)
- Encourage teammates to sit out if you notice them starting to show signs of EHS
- Let your coach, athletic trainer or a parent know right away if you or another player start feeling any symptoms
- Get plenty of sleep the night before practice
- Drink plenty of water
- Don't practice if you're sick
- Make sure you take time to adapt to the heat, don't push yourself too quickly
- Bring fluids with you to practice everyday
- Check to make sure you're well hydrated by looking at the color of your urine; it should be the color of lemonade, NOT the color of apple juice

For further information, here are articles with more in depth discussion:

1. Exertional Heatstroke: A Medical Emergency, segment "Exertional Heat Illnesses" by Lawrence Armstrong; 2003
2. Position Statement: Exertional Heat Illnesses
Published by the National Athletic Trainers' Association in the Journal of Athletic Training; 2002
3. Position Stand: Exertional Heat Illness during Training and Competition,
Published by the American College of Sports Medicine; 2007
4. Inter-Association Task Force on Exertional Heat Illness Consensus Statement
5. Position Statement: Preventing Sudden Death In Sport
Published by the National Athletic Trainers' Association in the Journal of Athletic Training; 2012