

Exertional Heat Illness

Dear Parent/Guardian and Athletes,

This information/acknowledgement sheet is provided to assist you and your child in recognizing the signs and symptoms of heat illness. All athletes have different tolerance levels to heat and physical activity. The most severe type of heat illness common in sports is exertional heat stroke. Our sports medicine team follows a specific protocol for heat illnesses.

Types of Exertional Heat Illness

Exertional heat illnesses (EHI) can vary in symptoms and severity. Exercise associated muscle cramps, heat syncope, heat exhaustion, and heat stroke are the most common heat illnesses affecting athletes.

Exercise Associated Muscle Cramps (EAMC)

Symptoms of EAMC include visible cramping, pain, dehydration, thirst, sweating, and fatigue. Current research indicates that some athletes may experience dehydration and loss of fluids and electrolytes along with EAMC, this is not necessarily the cause. Studies indicate that neuromuscular overload and fatigue may be the main cause behind EAMC. The most successful treatment for EAMC is stretching. If cramping symptoms persist, seek further medical attention. Patients typically can return to activity when symptoms resolve.

Heat Syncope

Heat syncope is also known as exercise associated collapse. Symptoms include fainting, dizziness, tunnel vision, pale or sweaty skin, and decreased pulse rate. Treatment includes moving the patient to a shaded area, monitoring vital signs, elevating the legs, cooling the skin, and drinking fluids. Patients should not return to activity on the same day but may return when symptoms resolve, and any other causes have been ruled out.

Exertional Heat Exhaustion

Symptoms of exertional heat exhaustion include fatigue, fainting, collapse, headache, dizziness, mild confusion, weakness, low blood pressure, vomiting, and nausea. Core body temperature during heat exhaustion is under 104°F. Treatment includes removing excess equipment and clothing, moving the patient to a cool or shaded area, fans and ice towels to assist in cooling, and elevating the legs. If symptoms do not improve, seek further medical treatment. Patients should not return to activity on the same day and should follow a gradual return progression after 24-48 hours.

Exertional Heat Stroke (EHS)

The most serious and life threatening of all EHIs is exertional heat stroke. The first 2-3 weeks of preseason practice, especially for equipment intensive sports, are greatest risk for EHS. Symptoms include disorientation, confusion, dizziness, loss of balance, staggering, irritability, unusual behavior, apathy, aggressiveness, hysteria, delirium, collapse, loss of consciousness, and coma. Patients may also have low blood pressure, hyperventilation, and hot, sweaty skin.

Key to differentiating between heat exhaustion and heat stroke is the patient's core body temperature. Core body temperature is assessed by using a rectal thermometer. Core temperature of over 104°F indicates heat stroke.

The two most important factors in surviving EHS are how high the core body temperature is and how long they stay above 104°F. The quicker the body temperature is brought below 104°F, the better the chance for survival.

Treatment for EHS is full body cold water immersion. The patient's core temperature is monitored during treatment. Once core temperature is below 102°F, the patient should be transported via ambulance to the nearest hospital for further treatment. Patients should be cleared by their doctor before resuming a gradual return to activity.

If not treated promptly EHS can lead to organ failure and death.

Why assess core temperature?

Core temperature must be assessed in suspected cases of exertional heat stroke to rule out other causes such as rhabdomyolysis, sickle cell trait, hyponatremia. Determining a correct diagnosis is essential in correctly treating the patient. Kettering Health Network athletic trainers will assess core temperature using digital rectal thermometers with flexible probes and will take steps to minimize exposure of the patient. Assessing and monitoring core temperature is the gold standard of the National Athletic Trainers' Association and the American College of Sports Medicine for diagnosis and care of exertional heat stroke.

Prevention of Exertional Heat Illnesses

Using Wet Bulb Globe Temperature (WBGT) as a guideline for activity levels is important in prevention of EHI. WBGT takes into account the temperature, humidity, wind speed, sun angle, and cloud cover. This measurement is different than heat index, so the numbers may not be what you expect to hear. However, WBGT is the most appropriate measure for heat stress when dealing with physical activity. Athletic trainers from Kettering Health Network monitor WBGT during activities and inform coaches and school administration of proper recommendations and adjustments to be made.

Following proper acclimatization guidelines is key in preventing EHI. Staying hydrated, having a balanced diet, and adequate sleep are also important in prevention. Be aware that having a history of previous EHI is a predictor of an EHI occurring again. Risk factors for EHI include: viral infection, poor physical condition, electrolyte imbalance, high BMI, exercise intensity, overzealousness, and taking medications and supplements including but not limited to: stimulants, antihistamines, antipsychotics, and anticholinergics.

Questions or Concerns

If you have any questions, please contact your Kettering Health Network Sports Medicine Department Manager.

- **Dayton Sports Medicine Institute - 937-401-6400**
- **Kettering Sports Medicine - 937-395-3903**
- **Fort Hamilton Sports Medicine – 513-867-2473**

Resources

National Athletic Trainers' Association

Casa, D. J., Demartini, J. K., Bergeron, M. F., Csillan, D., Eichner, E. R., Lopez, R. M., . . . Yeargin, S. W. (2015). National Athletic Trainers' Association Position Statement: Exertional Heat Illnesses. *Journal of Athletic Training*,50(9).

American Family Physician

Gauer, R., MD, & Myers, B., DO. (2019). Heat Related illnesses. *American Family Physician*,99(8), 482-489.

American College of Sports Medicine

Armstrong, L. E., Casa, D. J., Millard-Stafford, M., Moran, D. S., Pyne, S. W., & Roberts, W. O. (2007). Exertional Heat Illness during Training and Competition. *Medicine & Science in Sports & Exercise*,39(3), 556-572.

I have read the Heat Illness Information Sheet and understand the prevention, recognition, and treatment for exertional heat illnesses.

Athlete: _____ Date: _____

Athlete Printed Name: _____

Parent/Guardian: _____ Date: _____