Prevention of Heat Related Illness in Young Athletes
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Athletic associated heat related illness is common, with children and adolescents at higher risk than adults. Over 9,000 cases occur each year in the United States, with the highest rate among football players (10 times that of other sports), occurring mostly in August. If not treated, heat related illness may progress to heat stroke, a life threatening problem.

Signs of Heat Related Illness
Thirst is not a reliable indicator of hydration. An athlete may lose 5 to 10 percent body weight before feeling “thirsty.” In an attempt to maintain the same level of athletic intensity, the athlete will “work harder” than other competitors.

Heat related illness progresses from heat cramps to heat exhaustion, and can progress to heat stroke, the most serious and potentially deadly form of heat illness.

Signs of heat related illness include irritability, decreased performance, fatigue, weakness, headache, muscle cramping, dark yellow urine / low urine volume, lightheaded feeling / dizzy and difficult paying attention.

An athlete that begins to exhibit symptoms should be removed from competition and treated immediately. Treatment includes removal of clothing and equipment, rest in a cool place and intake of fluids, especially sports drinks with electrolytes.

Heat Cramps
Heat cramps are painful involuntary whole-body cramps caused by depletion of salt and water through profuse sweating.

**Signs:**
-“Knotting” of muscles and muscle pain
-Excessive sweat
-Excessive salty sweat or visibly dried salt on skin
-Excessive dehydration

**Treatment:**
-Drink fluids with electrolytes, such as sports drinks or Pedialyte
-Gently stretch or massage cramped muscles
-Rest in a cool place
-Ice cramps
-Intravenous saline for those who fail to respond
Heat Exhaustion

Heat exhaustion is fatigue and exhaustion occurring as a result the body’s inability to support exercise and core body temperatures. Importantly, athletes with heat exhaustion improve quickly with management, whereas athletes with heat stroke get worse.

**Signs:**
- Dizziness / fatigue
- Feeling chilly
- Rapid pulse
- Profuse sweat or pale skin
- Headache, nausea, vomiting or diarrhea
- Abdominal cramps or persistent muscle cramps

**Treatment:**
- Cool, shaded rest and application of ice cold towels
- Drink sports drinks with electrolytes
- Lie down with legs elevated to improve circulation

The athlete should feel better quickly with these treatments. If not, assume that he or she is experiencing heat stroke.

Heat Stroke

Heat stroke, a medical emergency, occurs as heat exhaustion progresses to thermoregulatory failure. Core body temperature approaches 104°F; as a result, organ damage may occur. When not recognized and treated quickly and properly, heat stroke may result in death. Always transport a suspected heat stroke patient to the hospital.

**Signs:**
- Heat exhaustion progresses; however, heat stroke may occur suddenly without preceding signs
- Athlete is usually unconscious, with hot dry skin; he or she may sweat profusely, contrary to popular belief
- High core body temperature (measured by rectal temperature)
- Altered central nervous system function, including:
  - Confusion / unconsciousness / altered mental state
  - Feeling “out of sorts”
  - Extremely lethargic
  - Collapses while exercising in heat
**Treatment:** Immediate transport to nearest medical facility. Begin cooling while waiting for emergency services. Rapid cooling by whatever means possible, is imperative. Generally, the cooling source removed when the body temperature is lowered to 102ºF or below.

- Ice bath is preferred; hold athlete’s head out of bath
- Apply ice packs over as much of the body as possible
- Cool shower
- Cool wet towels
- Water spray

**Prevention of Heat Related Illness**
Athletes should be fully hydrated before exercise. They should learn to recognize urine color as a sign of hydration status. A light clear or lemonade color indicates proper hydration, but yellow or apple juice color indicates dehydration.

**Proper Hydration**
Many young athletes are chronically, inadequately hydrated. Fluid requirements for young athletes are generally about 0.5 – 1.0 liter/day above normal “baseline” requirements for youth. The National Athletic Trainers’ Association (NATA) recommends adequate hydration beginning four hours prior to exercise and heat exposure. In general 5-7 ml/kg body weight (12 – 20 oz. fluid) of fluids is recommended.

There is generally no benefit of sports drinks over water when exercising for less than one hour. Non-carbonated, lightly sweetened and flavored drinks with electrolytes are preferred, as the athlete may drink more of these. Beverages should be cool.

Drinks to avoid:

- Fruit juices (these have a high sugar content with subsequent slow fluid absorption and cramps)
- Caffeinated beverages (which have a diuretic effect)
- Carbonated drinks (less volume will be consumed, due to stomach fullness)
- Energy drinks (for their caffeine and high sugar content)
- Alcohol

Recommendations for fluids during athletic practice or competition are based upon the heat index, especially for football teams during hot months. Many teams require that the athlete weigh-in before and after each workout, to help monitor for dehydration. Generally fluids should be on the field and easily available in unlimited quantity.