Title: Recognition, Prevention, and Treatment of Heat Illnesses

Document of (Entity): Beacon Medical Group Orthopaedics & Sports Specialists & Memorial Athletic Trainers

Policy: The following policy and procedures on recognition, prevention and treatment of heat related illnesses has been developed in accordance with the goal of the Beacon Medical Group Orthopaedics & Sports Specialists & Memorial athletic trainers to provide quality healthcare services and assure the well-being of each athlete treated by the athletic trainers employed by Memorial Hospital and Beacon Medical Group Orthopaedics & Sports Specialists.

Patient Population: Any patient thought to have a heat related illness.

Purpose: Beacon Medical Group Orthopaedics & Sports Specialists & Memorial recognize that heat related illnesses due to physical activity increase with respect to high temperature and relative humidity. Participants in fall sports, who have preseason during the end of summer, have a higher incidence of heat related illnesses than those who take part in winter and/or spring sports. Therefore, the Sports Medicine athletic trainers have implemented policies and procedures to deal with the recognition, prevention, and treatment of heat related illnesses. In addition the Sports Medicine athletic trainers also recognize that dehydration of just 1-2% of body weight can alter physiological function and negatively influence an athlete’s performance. Athletes who are not properly hydrated prior to the start of practice or competition can begin to notice the signs of dehydration in just one hour or sooner of exercise. Dehydration has been identified as an increased risk factor for athletes developing heat-related illnesses.

Prevention of Heat Illnesses:

- All pre-participation examinations will identify athletes who may be predisposed to heat illnesses or have a history of heat illnesses.
- Encourage athletes to get 6-8 hours of sleep per night in a cool environment and eat a well balanced diet that follows the food guide pyramid, especially during 2-a-day practices.
- During 2-a-days, it is ideal for athletes to have 2-3 hours rest periods at meal time to allow for food and fluids to be properly replenished.
- Practices should be no longer than 2 hours, and should have mandatory drink breaks at least every 45 min. (SBCSC Athletic Department Rule)
- The certified athletic trainer will be onsite at most practices and competitions to assist in providing hydration and access to further cooling supplies. Certified athletic trainers and athletic coaching staff will be aware of the signs and symptoms of heat illness to properly recognize and intervene on behalf of the athlete.
- The certified athletic trainer will also help educate athletes and coaches regarding the necessary time needed to have student-athletes adapt to their environment. Acclimatization should be a gradual progression. Well-acclimatized athletes should be able to train 1 to 2 hours under the same heat conditions that will be present for their event.
Check environmental conditions before and during activity and adjust practice and/or game schedules accordingly. For example, if we know that the forecast for a day is going to be high temperatures with high humidity, the certified athletic trainer will notify the coaching staff to make sure any adjustments to a practice will be made. Adjustments can be: altered practice times, a decrease in practice duration, an increase in the frequency of rest/water breaks, and/or a decrease in the equipment being worn.

**SIGNS and SYMPTOMS of DEHYDRATION:**
Certified athletic trainers and athletic staff need to be aware of the potential signs and symptoms of dehydration to properly recognize the presence of a heat illness in order to intervene on behalf of the athlete.

1. Thirst
2. Nausea
3. Irritability
4. Cramps
5. Chills
6. Headache
7. Head or Neck Heat Sensations
8. Weakness
9. Dizziness
10. Decreased Performance
11. General Discomfort
12. Vomiting

**REHYDRATION GUIDELINES:**
The Beacon Medical Group Orthopaedics & Sports Specialists & Memorial athletic trainers have developed the following rehydration guidelines based on nationally accepted criteria. The certified athletic trainers will assist in promoting the consumption of beverages.

**Prior to Exercise:**
- All athletes should be encouraged to drink 17 to 20 fluid ounces of water or sports beverage 2-3 hours before exercise.
- Ten to twenty minutes before the beginning of practice or competition, athletes should be encouraged to drink an additional 7-10 fluid ounces of water or sports beverage.

**During Exercise:**
- Encourage athletes to drink early and often (sip, not gulp?)
- Drink 7-10 fluid ounces or sports drink every 10-20 minutes.
- It is important to stress to the athletes to drink prior to becoming thirsty. An athlete who is thirsty may already be in the early stages of dehydration.

**After Exercise:**
- Encourage athletes to replace any fluid loss due to sweating within 2 hours from the end of exercise. This rehydration should include water, carbohydrates, and electrolytes to allow the immediate return of physiologic function.
- Encourage them to drink 20-24 fluid ounces for every pound of weight lost.

**Sport beverages should ideally contain a carbohydrate level of no more than 8%. A higher carbohydrate level can retard fluid absorption and cause stomach problems.**

**Fruit juices, carbohydrate gels, and carbonated beverages should not be recommended as the sole rehydration beverage of choice.** Beverages containing
caffeine, alcohol, or carbonation should be avoided and discouraged due to their diuretic effects and decreased fluid retention.

**WEIGHT LOSS/GAIN GUIDELINES:**
It is recommended that all athletes exercising in hot and humid environments, as well as those sports such as wrestling with closely regulated weight classes should be weighed in prior to and after practice or competition. By weighing in, a determination can be made of the percentage body weight lost due to sweating and the amount of rehydration that must occur prior to the next practice session. Furthermore, athletes should be weighed preferably in clean/dry undergarments, or wearing the same amount of clothing pre-and post-practice. The percentage of weight lost between practice sessions will be used as one factor to determine if an athlete can safely continue to practice. Athletes should ideally have their pre-exercise body weight remain relatively consistent.

- A 2% body weight difference should be noted by the athletic trainer and that athlete should be closely monitored for any signs or symptoms of dehydration.

- An athlete with greater than 2% body weight loss should not be allowed to return to practice until proper fluid replacement has taken place.

**DEFINITION and SYMPTOMS of HEAT ILLNESSES:**

**Heat Illnesses**- are closely associated with physical activity and its occurrences increase with a rise in temperature and relative humidity. They are usually classified in three categories: heat cramps, heat exhaustion, and heat stroke. Although most often occurring in hot, humid weather, heat illnesses can also occur with the absence of both heat and/or humidity.

**Exercised associated Muscle (Heat) Cramps**- is an acute, painful, and involuntary muscle contraction and can occur during or after intense exercise.

- Causes may include dehydration, electrolyte imbalances, neuromuscular fatigue, or a combination of factors.

- **Signs and Symptoms**: dehydration, thirst, sweating, transient muscle cramps, fatigue.

**Heat Syncope (dizziness)** - is a sudden dizziness (possible fainting) experienced after exercising in the heat.

- Can be caused by lack of acclimatization to weather conditions (usually seen within the first 5 days of practices or preseason).

- **Signs and Symptoms**: dizziness, pale moist skin, tunnel vision, decreased pulse rate, normal body temperature.

**Exercise (Heat) Exhaustion**- is a moderate illness and occurs most frequently in hot, humid conditions with strenuous activity. Heat Exhaustion is caused by an inability to sustain adequate cardiac output and causes the inability to continue exercise.

- May be caused by dehydration, heavy sweating, sodium loss, and energy depletion.

- **Signs and Symptoms**: pallor, persistent muscle cramps, urge to defecate, weakness, fainting, nausea, decreased urine-output, cool and clammy skin, possible altered mental status, diarrhea, and body temp between 97-104 ° F.

**Exertional Heat Stroke**- is a severe illness characterized by Central Nervous System (CNS) abnormalities and potential tissue damage resulting from an elevated core
temperature (usually greater than 104°F) with associated signs of organ system failure due to hyperthermia and physical activity.

- Caused by an overwhelmed temperature regulation system due to excessive endogenous heat production or inhibited heat loss due to environmental conditions.

- **Signs and Symptoms:** tachycardia, hypotension, sweating (although skin may be wet or dry), hyperventilation, altered mental status, vomiting, diarrhea, seizures, coma, CNS changes.

- Life-threatening condition that can be fatal unless promptly recognized and treated.

**Exertional Hyponatremia** - is when an athlete’s blood sodium levels decrease, medical complications can result in cerebral and/or pulmonary edema. This tends to occur during warm/hot weather activities. Hyponatremia may be completely avoided if fluid consumption during activity does not exceed fluid losses.

- May be caused by overhydration, or inadequate sodium intake.

- **Signs and Symptoms:** Excessive fluid consumption before, during, and after exercise (weight gain during activity), increasing headache, nausea, vomiting (often repetitive), swelling of extremities (hands and feet), altered consciousness, seizures, lethargy.

**MANAGEMENT:**

In any circumstance where a heat illness is suspected, the first priority is to remove the athlete from further participation until a thorough sideline exam can be performed. Furthermore, if there is a concern of the mental state of clearing, the certified athletic trainer should err on the side of conservative assessment until the athlete can be examined by a physician.


**Exercised associated Muscle (Heat) Cramps** -

- The athlete should stop activity, replace lost fluids (containing sodium), and begin mild stretching and massage of the muscle spasm.

- Instruct the athlete to lie down, as this may allow blood flow to be distributed more rapidly to cramping leg muscles.

- **Return to Play Considerations:** athlete should be assessed to determine if they can perform at the level needed for successful participation. Return to activity should be gradual and monitored.
**Heat Syncope (dizziness):**
- The athlete should stop activity, be moved to a shaded cool area, rehydrate and monitor vital signs.
- Instruct the athlete to lie down and elevate athlete’s legs above the level of the head.
- *Return to Play Considerations:* athlete should be assessed to determine if they can perform at the level needed for successful participation. Return to activity should be gradual and monitored. Discussion with supervising physician may be needed.

**Exercise (Heat) Exhaustion:**
- Assess cognitive function and vital signs, taking body-core temperature (rectal temperature is preferred method, if feasible).
- Transport the athlete to a cool and/or shaded environment, remove excess clothing, start fluid replacement, and cool the student-athlete with fans, ice towels, or ice bags (placed in armpits, neck, and groin). (or cold water immersion if available)
- The athlete should be referred to the team physician and/or the emergency room of the closest hospital if in the judgment of the attending certified athletic trainer symptoms warrant further immediate attention.
- *Return to Play Considerations:* athlete should be symptom free fully hydrated; recommend physician clearance; rule out underlying condition that predisposed him/her for continued problems, and avoid intense practice in heat until 24 hours. Return should be gradual and monitored.

**Exertional Heat Stroke:**
- Activate the emergency medical system.
- Assess cognitive function and vital signs, measuring rectal temperature if feasible to differentiate between heat exhaustion and heat stroke (heat stroke is 104°F or higher).
- “Immediate cooling is paramount.” Even once EMS activated, aggressive cooling should continue. Ice-Water immersion is preferred method. Realize there are no readily available ice baths in ambulances or ERs
- Lower the body-core temperature as quickly as possible by removing excess clothing and immersing the body into a tub of cool water (35 - 59°F) while checking temperature every 5 to 10 minutes. Remove athlete from water if temperature reaches 101 to 102°F to prevent overcooling.
- Continue using cooling methods mentioned for heat exhaustion while transporting to decrease body-core temperature.
- Maintain and monitor airway for breathing and circulation.
- *Return to Play Considerations:* athlete must be cleared by physician before returning to athletic participation, and return should be gradual and monitored.
Exertional Hyponatremia:

- If blood sodium levels cannot be determined onsite, hold off on rehydrating athlete (may worsen condition) and transport immediately to medical facility.

- An athlete with suspected hyponatremia should not be administered fluids until a physician is consulted.

- Return to Play Considerations: athlete must be cleared by physician before returning to athletic participation, and return should be gradual and monitored.

SUMMARY:

The Beacon Medical Group Orthopaedics & Sports Specialists & Memorial athletic trainers are proactive in the recognition, prevention, and treatment of heat illnesses in order to limit the risks of heat illnesses associated with athletics. As well as to limit the potential catastrophic and long term risks associated with heat illnesses. Therefore the management and return to play decisions will remain in the realm of clinical judgment on the individualized bases by both the certified athletic trainer and the team physician.

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<td>08/24/2010</td>
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<td>Revised 05/23/2019</td>
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