Evaluation & Treatment of Heat Related Emergencies

The next several days are anticipated to have some of the year's highest temperatures. It is essential to recognize, assess and treat various heat illnesses as EMS clinicians.

Bottom Line Up Front:

1. **Heat illness can be life-threatening. Exertional heat stroke (EHS) is a life-threatening injury recognized by elevations in body core temperature (>40.5°C [104°F]) and central nervous system (CNS) dysfunction (e.g., seizures, disorientation).**
2. **Get a temperature as part of the vital signs!**
3. **Patients experiencing heat stroke, as defined above, should be treated as critically ill and need immediate cooling to begin (cool to 38.9°C (102°F)) before transport.**

Here are some general facts:

- People with evidence of heat illness and altered mental status are experiencing a potentially life-threatening emergency and need immediate cooling and prompt transport. (Start the cooling before transporting!)

- General treatment for all heat illness is getting **someone out of the heat**. In addition, move to a cool place, loosen, or remove tight or restrictive clothing, cool the body down using wet towels, cool water submersion of bilateral forearms, or even whole body (not including the head) water immersion to lower the body's core temperature.

- Research shows that fanning alone is ineffective when temperatures exceed 90 degrees F. Applying a wet sheet to facilitate evaporative covering them in a wet sheet and adding fans can assist in cooling.

- Heat illness represents a spectrum of diseases that can span from dehydration, heat cramps, heat exhaustion, and a more severe and life-threatening heat stroke.

- Heat illnesses happen when the body's normal regulatory systems cannot keep up with the environmental and physical stresses on the human body.

- Many factors, including chronic medical conditions, medication use, prior heat illness, and extremes of age, can contribute to how rapidly a heat emergency can develop. Specific medications to watch out for that increase your chances of heat-related illness and diminish your body's ability to compensate include Beta-Blockers, anti-depressants, antipsychotic medications, and antihistamines.

Here is some more detailed condition-specific information:

- *Sunburn:* Can result in painful, red, warm skin with or without the addition of blisters on the skin. Prevention is key: wear hats and sunscreen and limit sun exposure. Treatment of sunburn involves applying moisturizing lotion on sunburned areas and do not break blisters.

- *Heat Cramps:* Muscle cramps due to electrolyte depletion. It may occur during exercise but is more common during rest several hours later. Typically, it does not involve enough muscle mass to cause rhabdomyolysis. Stop any physical activity and move to a cool place. If mild-

consider oral electrolyte solutions, such as sports drinks. More severe cases need to have electrolytes checked and IV fluids.

- *Heat Exhaustion:* Results from exposure to excessive heat or extreme temperature for a prolonged period. Signs and symptoms: Known heat exposure with temperature 37-40C. Tachycardia, Sweating, Nausea or vomiting, Headache, Fatigue, Weakness, Dizziness, orthostatic hypotension with **normal mental status**. Treatment: Removal from heat-stressed environment, volume, and electrolyte replacement. Oral repletion (if tolerating PO) vs. IV, depending on severity. Cooling measures include cool towels, water submersion of extremities, and evaporative cooling.

- *Heat Stroke:* Severe end of heat-related illness spectrum. **This emergency is universally fatal if left untreated** (Mortality approaches 30% even with treatment). Results in multisystem organ dysfunction from heat-induced damage resulting in systemic inflammatory response. Signs and symptoms: Temperature >40°C (104°F) and neurologic abnormalities (e.g., inappropriate behavior, Confusion, slurred speech, Delirium, Ataxia, Coma, Seizures). Anhidrosis (No Sweating) may be present; however, its absence does exclude the possibility of heat stroke. Treatment: Remove the patient from the hot environment. Begin cooling immediately. Protect the airway. Establish IV/IO access and give fluid boluses per MMP. **Cooling can be accomplished quickly by immediate cool water immersion of body extremities in water.** Diffuse application of ice or cold packs to the entire body may provide similar benefits. Some studies show increased survival if cooling can begin within 30 minutes of collapse. We should make all efforts to cool the person before starting transport. Benzos should still be administered if a patient develops seizures in conjunction with rapid cooling, and don't forget to check the patient's glucose.

Stay safe, take care of one another, and hydrate!