

**Heat & The Athlete:**  
**The Prevention & Treatment of Exercise-Induced Heat**  
**Illness**

Terry K. Gemas, MD

*(Dr. Gemas is a board certified orthopaedic surgeon specializing in sports medicine and practicing at Lakewood Orthopaedics & Sports Medicine here in the White Rock Lake area.)*

With most high schools returning to preseason preparations for the upcoming football season, temperatures are at or near record highs. These high temperatures should be a focus of the coaches when planning out their practice schedules this month. In addition, other Fall semester sports such as cross country and soccer must keep these high temps in mind when laying out their training schedules as well; but, certainly, with the added equipment and physical size of football players, our attention turns to them when discussing heat problems during outdoor athletic activity though all sports can gain some knowledge from this discussion.

Heat acclimatization for the athlete is a systematic, step-by-step process. The National Athletic Trainers' Association (NATA) is one of the leading organizations studying this subject and has published a vast amount of information on this topic. A proper plan by athletic programs is essential to minimize the risks with improper heat acclimatization. The NATA and other related organizations have developed a consensus statement to help athletic programs recognize the problems that can occur with athletic exertion on hot days and help guide them in acclimating their athletes safely prior to getting into the bulk of their season. When an athlete undergoes proper heat acclimatization, his/her body's response to heat during exercise is enhanced; therefore, their performance improves.

The NATA consensus statement lists seven key recommendations for a 14-day heat acclimatization period:

1. During the first 5 days, athletes may not participate in more than one practice/day.

2. The total practice time/day should not exceed 3 hours even if it is interrupted because of inclement weather or excessive heat.
3. In addition to the 3 hours of practice/day, a one-hour maximum walk-through is permitted during the first 5 days of this 14-day period, but *must be separated by at least 3 hours from the end of the daily practice.*
4. During the first 2 days, only helmets should be worn (with shorts and t-shirts); days 3-5 shoulder pads may be added; full equipment is worn starting on day six.
5. Beginning on day 6, two-a-days may begin, but must be followed by a single-practice day (the one-hour walk-through is allowed on the single-practice days).
6. On two-a-days, *both a single practice's time should not exceed 3 hours and total practice time for the day should not exceed 5 hours.* The two practices should be separated by at least 3 continuous hours in a cool environment.
7. A certified athletic trainer is recommended to be on-site before, during, and after all practices during the 14-day acclimatization period.

Presently, several organizations including the NCAA and Texas UIL have adopted at least a portion of these guidelines for their athletes. For those who haven't, we certainly encourage them to do so. Obviously, individuals (ex: marathoner) and *informal* organizations (ex: local club sports) may not follow this protocol, but, perhaps, a variation of one.

How do we define *exertional heat illness*?

There are 3 categories: heat cramps, heat exhaustion, and heat stroke. *Heat (muscle) cramps* occur during or after intense exercise and present as painful muscle contractions. Causes include dehydration, electrolyte imbalance, muscular fatigue, or any combination. *Heat exhaustion* results in the inability to continue exercise due to heavy sweating, dehydration, loss of electrolytes (sodium), and energy depletion. Signs and symptoms may include muscle cramping, weakness, dizziness, nausea, headache, decreased urine output, and core body temperature up to 104 F. *Heat stroke* is defined as a core body temperature greater than 104 F. It can be associated with signs of organ system failure. Signs and symptoms include decreased sweating, low blood pressure

with increased heart rate, altered mental status, vomiting, seizures, and coma.

How do we treat *exertional heat illness*?

The immediate treatment of heat cramps is mild stretching and massage of the muscle spasm. The athlete should stop the activity and replace lost fluids with sodium-containing fluids, such as sports drinks. He/she may return to play during that event when all signs point to normalcy.

With heat exhaustion, neurologic changes are usually minimal, but must be assessed by a trained professional, such as a certified athletic trainer or physician. Core body (rectal) temperature and vital signs should be measured. The athlete's excess clothing should be removed to allow for improved cooling. Assist the cooling of the athlete with fans, ice towels, or a cold bath. Move them to a cooler, shaded area and begin fluid replacement. Be prepared for transfer to a medical facility if the recovery is not rapid and consider clearance by a medical doctor before return to play.

If the athlete is suffering from heat stroke in which there is a significantly altered mental status along with the rectal temperature of greater than 104 F, it is imperative that his/her clothes are removed and their body (trunk and extremities) is immersed in a tub or pool of cold water (35 F – 59 F) *immediately*. He/she may be removed when their core temperature becomes less than 101 F. As with heat exhaustion, be ready for transfer to a medical facility. Always have the athlete cleared by a medical doctor before return to play.

## **References**

Various articles, *The Journal of Athletic Training*.