

Preventing Heat Exhaustion and Dehydration

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Heat-related illness and dehydration syndromes have always been concerns for coaches, athletes and their parents. The events of the 2001 NFL pre-season have served to heighten our concerns. Each year heat-related illness and dehydration syndromes affect thousands of athletes at all levels and continues to be among the leading causes of preventable sports injury and death.

What are we talking about?

Heat-related illness and dehydration syndromes include heat rash, heat cramps, heat exhaustion and heat stroke. These should not be seen as individual entities but as part of a continuum. The earlier the intervention, the better the odds of averting a disastrous chain reaction.

How does this work?

The skin is the key to the body's ability to regulate its temperature (thermoregulation). Once the brain senses that there is an increase in temperature, it initiates thermoregulatory mechanisms. The skin is the main cooling organ. It maximizes heat loss by using radiation, convection, conduction and evaporation. Radiation – heat is directly lost to the atmosphere. Convection – heat loss is facilitated by moving air or water vapor. Conduction – heat loss by direct contact with a cooler body. Evaporation – heat is lost by turning liquid (sweat) into vapor (the skin's major heat loss mechanism).

It's not so much the heat, it's the humidity. If the skin is so effective at cooling, why do athletes get into trouble? First, for any of the skin's cooling mechanisms to work, there needs to be adequate skin exposure. The problem is the much-needed sports safety equipment does not facilitate optimal skin exposure. Secondly, the environment needs to be conducive for heat transfer from the body. The combination of high temperatures and humidity severely impair the cooling mechanisms, especially evaporation. It is often the environment that athletes are training and competing in. For morphologic and physiologic reasons children do not adapt as effectively when exposed to heat stress, making young athletes more susceptible to heat-related illness and dehydration syndromes.

What can you do?

Stay cool:

- Work out in early morning or late evening. Avoid the hottest times of the day.
- Reduce the intensity and duration of your workout.
- Take the time to get into shape before arriving at training camp. Know the climate you are going to and try to get acclimated before getting there.
- Take frequent rests and remove your headgear. The head has an ideal body-mass to surface-area-ratio to maximize heat loss.

Stay hydrated:

- Drink often and drink regularly. Do not rely on thirst, by the time you are feeling thirsty, there is already a significant fluid deficit.
- Drink more than just water. When you exert yourself, you lose electrolytes as well as fluid. Replacing the fluid alone (with just water) can lead to electrolyte imbalances. These imbalances can be life-threatening.

- Monitor your urine, it should be the consistency of lemonade, not apple juice.

Stay healthy:

- Eat and sleep well. Maintain a well-balanced diet. Replenish salt and rehydrate. Avoid alcohol, soda, caffeine and other stimulants.
- Gain or lose weight slowly, allowing your body time to acclimate to the change.
- Sharp drops in weight after exertion can be an indicator of excessive fluid loss.
- Know the warning signs of heat-related illness and dehydration syndromes.

What to look for?

- Confusion – cannot remember simple things, complete simple/routine tasks.
- Irritability – a change in temperament.
- Belligerence – easily frustrated, compounded by the confusion and irritability.
- Lightheadedness
- Incoordination
- Fatigue – in excess of what would be anticipated.
- Paradoxical chills – goose bumps and shivering in the face of high environmental temperature (an ominous sign).

If you or some one else is exhibiting these symptoms:

1. Stop the activity immediately.
2. Move to a cool (shaded) area.
3. Get some fluid (water, sports drink, IV).
4. Contact a health professional or your sport safety certified coach.

So where do we go from here?

In hindsight, most cases of heat related-illness and dehydration syndromes could have been prevented and should have been predicted. With a working knowledge of heat-related illness and dehydration syndromes, a moderate level of suspicion and a little common sense, everyone can get through two-a-days safely (even in the dog days of August).

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