



Heat Injury Prevention & Management

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Heat Injury Hazards are Cumulative



- ◆ H- Heat category past 3 days
- ◆ E- Exertion level past 3 days
- ◆ A- Acclimation/ other individual risk factors
- ◆ T- Temperature/rest overnight
- ◆ Cluster of heat injuries on prior days= HIGH RISK



Individual Risk Factors

- ◆ Poor fitness
- ◆ Large body mass
- ◆ Minor illness
- ◆ Drugs (cold and allergy, blood pressure)
- ◆ Highly motivated



Individual risk factors

- ◆ Supplements- ephedra
- ◆ Recent alcohol use
- ◆ Caffeine use
- ◆ Prior heat injury
- ◆ Skin problems- rash, sunburn, poison ivy
- ◆ Age > 40 (coaches)

Drugs that Interfere with Thermoregulation



- ◆ Antihistamines (benadryl, atarax, ctm)
- ◆ Decongestants (sudafed)
- ◆ High Blood Pressure (diuretics, beta blockers)
- ◆ Psychiatric Drugs (tricyclic antidepressants, antipsychotics)



Impact of dehydration

- ◆ Degrades performance
 - 4% dehydration degrades performance 50%
 - 1 pound = 1 pint of fluid
- ◆ Increases core body temp
 - Every 1% increases core temp 0.1- 0.23° C



Risk Reduction - Acclimation

- ◆ Acclimation requires aerobic exercise in warm environment.
 - Simply being outside doing normal activities is not sufficient
- ◆ Acclimation to the heat prior to the beginning of preseason practice takes from 7-14 days



Risk Reduction - Acclimation

- ✦ requires repeat outdoor exposure during this period of time.
 - These outdoor exposures should start with 15-20 minutes and lengthen over the two week course.
- ✦ Younger children may need more time to acclimate

Risk Reduction

Avoid Heat Loading



- ◆ Modify schedule- time of day, rest
- ◆ Clothing- loose; no layers
- ◆ Shade athletes whenever possible
- ◆ Cumulative- avoid strenuous back-to-back events

Risk Reduction

Dump heat load



- ◆ Cool overnight environment
- ◆ Cold showers





Risk Reduction - parameters

- ◆ Track Wet Bulb Globe Temp (WBGT)
- ◆ Track hydration of Athletes
 - Weigh in and out of practice
 - No training if lose > 3% of body weight
- ◆ If 1-2 athletes suffer heat injury- stop training and assess situation
- ◆ Fluid replacement / training / rest guidelines
- ◆ Keep urine clear



Types of Heat Injuries

- ◆ Heat Fatigue
- ◆ Heat Cramps
- ◆ Heat Exhaustion
- ◆ Heat Stroke



Heat Fatigue

- Generalized weakness and tired feeling
 - associated with a ***drop in performance***
 - In athletics and academics
- Occurs most frequently early in season before acclimation
- Treatment = acclimation, fluid replacement, and adequate carbohydrate and electrolyte intake



Heat Cramps

- ◆ Common; occur frequently in calf muscles.
 - not necessarily occur during exercise!
 - may occur in the evening at rest
 - May become very severe in athletic competition during extreme fluid and electrolyte loss
 - ◆ with many of the muscles throughout the body cramping; creating severe pain and increasing anxiety.



Heat Cramps - treatment

- ✦ Initially cramps best treated with stretching
 - Ice is sometimes helpful.
 - Foundation of treating all heat problems is acclimation & fluid



Heat exhaustion

- ◆ Much more serious
- ◆ Body is unable to eliminate heat as fast as it is being produced
- ◆ Symptoms typically include
 - dizziness, nausea, headache, increased pulse, sometimes cool clammy skin and disorientation
- ◆ Can progress quickly to heat stroke.



Heat Exhaustion - treatment

- ◆ Remove from heat immediately; begin cooling athlete ASAP
- ◆ Cooling most effective with water immersion
- ◆ wet towels, fanning, spraying with water and removal of clothing
- ◆ Fluid replacement as quickly as possible.
- ◆ Have small kiddie pools available with cool water on the practice field in a shaded area to rapidly cool athletes that are developing heat exhaustion



Milder heat injury management

- ◆ Rest athlete in shade
- ◆ Loosen clothing / remove head gear
- ◆ Have athlete drink 2 quarts of water over 1 hour
- ◆ Evacuate if no improvement in 30 min, or if athlete's condition worsens



Heat Stroke

- ◆ Abnormal brain function- elevated body temperature
- ◆ Hallmark: Impaired Neurologic Function
- ◆ Examples:
 - Confused
 - Combative
 - Passed out
 - Sudden death



Heat Stroke

- ◆ When an athlete's brain isn't working correctly- **COOL** and **CALL**
- ◆ Treat any athlete who develops abnormal brain function during warm weather activity as a heat stroke victim
- ◆ The sooner a victim with heat stroke is cooled, the less damage will be done to his brain and organs



Pre-hospital care

- ◆ Cooling is first priority- can reduce mortality from 50% to 5%
- ◆ Drench with water
- ◆ Fan
- ◆ Iced sheets
- ◆ Massage large muscles while cooling
- ◆ Stop if shivering occurs



Rapid cooling

- ✦ Cover as much exposed skin as possible with the cold, icy sheets.
- ✦ Also cover the top of the head
- ✦ When sheets warm up, put them back into cooler and then reapply





Evacuation criteria

- ◆ Vomits more than once
- ◆ No improvement after 1 hour of rest and hydration
- ◆ General deterioration
- ◆ Loss of consciousness/ mental status changes



Scenario

Awake victim- muscle cramps/headache





Scenario

Awake victim- muscle cramps/headache

- ◆ Move to shade/ or air conditioning
- ◆ Remove outer layer of clothing/
headgear
- ◆ 2 quarts of water over 1 hour



Scenario

Awake victim- abnormal behavior





Scenario

Awake victim- abnormal behavior

- ✦ Move to shade
- ✦ Remove outer layer of clothing
- ✦ Call for evacuation
- ✦ Begin rapid cooling- iced sheets
- ✦ May start IV after evacuation and cooling started



Questions?

