

# Heat Related Illness: Recognition, Treatment and Prevention

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## HEAT ILLNESS OVERVIEW

- Most incidences are preventable
- Who is at risk? >> **Intrinsic Factors**
  - Prior Hx of Heat Illness
  - Inadequate acclimatization
  - ↓ Fitness
  - ↑ %BF
  - Participants motivated to push themselves
  - Participants who assume the “Warrior Mentality”

## HEAT ILLNESS OVERVIEW (cont.)

- Who is at risk? >> **Extrinsic Factors**
  - Intense/Long exercise
  - ↑ Temperature / Humidity / Sun Exposure
  - ↓ Wind
  - Inadequate work/rest ratios
  - Inadequate fluids
  - Coach’s who Promote the “Warrior Mentality”
  - Parents who push Participants beyond capabilities.

## HEAT ILLNESS OVERVIEW

- **General Risk Reduction Principles**
  - Educate all staff, participants and their families
  - Provide onsite medical services
  - Empower medical providers to alter practice/events
  - Obtain adequate PPPX i.e. Hx & PE
    - In development the 3<sup>rd</sup> Ed. Pre participation Physical Examination Guidelines.

# HEAT ILLNESS RISK REVIEW

## EXERCISE RECOMMENDATIONS

### What is a HEAT ILLNESS ?

- **Dehydration**
  - Inadequate replenishment of lost fluids.
- **Heat Cramps (HC)**
  - Muscle fatigue after fluid/electrolyte imbalance.
- **Heat Exhaustion (HE)**
  - Strenuous exercise & Environmental heat stress w/ inability to sustain adequate cardiac output.
- **Exertional Heat Stroke (EHS)**
  - CNS abnormalities from elevated body temperatures induced by HE above.

### What is Dehydration ?

Minimal Dehydration, as little as 2% of body weight loss (BWL), can hinder performance.

- ***Recognition***
  - Dry mouth, thirst, irritability, general discomfort, headache, apathy, weakness, dizziness, cramps, chills, vomiting, nausea, head or neck heat sensations, excessive fatigue and/or decreased performance.

### What are Heat Cramps ?

Often present in athletes who perform strenuous exercise in the heat.

Conversely, cramps also occur in the absence of warm or hot conditions. Whether or not heat related, cramps tend to occur later in an activity, in conjunction with muscle fatigue.

- ***Recognition***

- *Most critical criteria for determination*

- (1) intense pain (*not* associated with acute muscle strain)

- (2) persistent muscle contractions in working muscles during and after prolonged exercise and most often associated with exercise in heat.

## What is Heat Exhaustion ?

Inherent needs to maintain BP & essential organ function, combined w/ fluid loss due to acute dehydration, challenge the body, especially when intense exercise is continued unabated.

- ***Recognition***

- Most Critical Criteria for Determination*

- Intense exercising in heat that cannot be continued

- Lacking severe hyperthermia (rectal temp. < 104°F/40°C)

- Most commonly seen is mild hyperthermia (100-103°F)

- Lack of severe CNS dysfunction.

## What is Heat Exhaustion ?

- ***Recognition (Continued)***

- Other possible salient findings*

- Physical fatigue.

- Dehydration and/or electrolyte depletion.

- Ataxia & coordination problems, syncope, dizziness.

- Profuse sweating, pallor.

- Headache, nausea, vomiting, diarrhea.

- Stomach/intestinal cramps, persistent muscle cramps.

- Rapid recovery with treatment.

## What is Exertional Heat Stroke ?

EHS is a severe illness characterized by CNS abnormalities and potentially tissue damage resulting from elevated body temperatures induced by strenuous physical exercise and increased environmental heat stress.

- ***Recognition***

- Most Critical Criteria for Determination*

- Presence of CNS dysfunction (altered consciousness, coma, convulsions, disorientation, irrational behavior, decreased mental acuity, irritability, emotional instability, confusion, hysteria, apathy)
- Presence of severe hyperthermia (rectal temp. usually >104°F/40°C) immediately post-incident

## What is Exertional Heat Stroke ?

- **Recognition (Continued)**

- *Other possible salient findings*

- Nausea, vomiting, diarrhea.
- Headache, dizziness, weakness.
- Hot and; wet or dry skin (important to note that skin may be wet or dry at time of incident).
- ↑ heart rate, ↓ blood pressure, ↑ respiratory rate.
- Dehydration.
- Combativeness.

## How is a HEAT ILLNESS Treated?

- **Dehydration**
  - Move to a cool environment and rehydrate.
- **Heat Cramps (HC)**
  - Re-establish normal hydration status & replace some sodium loss with a sports drink or other sodium source.
- **Heat Exhaustion (HE)**
  - Immediately move to a shaded or air-conditioned area.
- **Exertional Heat Stroke (EHS)**
  - Aggressive and immediate whole-body cooling.

## How is Dehydration *Treated* ?

- Move, cool and rehydrate.
- Fluid deficits should be replaced within 1 to 2 hours after exercise is complete.
- Sodium loss is replaced through foods and rehydration sports drinks.

### RETURN TO PLAY CRITERIA

- When BWL is <1-2% and athlete is symptom free.

## How are Heat Cramps *Treated* ?

- Additional sodium may be needed (especially in those with prior H/O HC) earlier in the activity (pre-cramps) and is best administered by dilution into a sports drink.
- Light stretching, relaxation and massage of the involved muscle may help acute pain of a muscle cramp.

### RETURN TO PLAY CRITERIA

Athletes should be assessed to determine if they can perform at the level needed for safe and successful participation.

- After an acute episode, diet, rehydration practices, electrolyte consumption, fitness status, level of acclimatization and use of dietary supplements should be reviewed and possibly modified to decrease risk of recurring heat cramps.

## How is Heat Exhaustion *Treated* ?

- Remove excess clothing and equipment.
- Cool athlete until rectal temperature is approximately 101°F (38.3°C).
- Have athlete lie comfortably with legs propped above heart level.
- If athlete is not nauseated, vomiting or experiencing any CNS dysfunction, rehydrate orally with chilled, sports drink or water. If athlete is unable to take oral fluids, implement intravenous infusion of normal saline.
- Monitor heart rate, blood pressure, respiratory rate, rectal temperature and CNS status.
- Transport to an emergency facility if rapid improvement is not noted with prescribed treatment.

## How is Heat Exhaustion *Treated* ?

### RETURN TO PLAY CRITERIA

- Athlete should be symptom free and fully hydrated.
- Recommend physician clearance or, at minimum, a discussion with supervising physician before return.
- Rule out underlying condition or illness that predisposed athlete for continued problems.
- Avoid intense practice in heat until at least the next day to ensure recovery from fatigue and dehydration. (In severe cases, intense practice in heat should be delayed for more than 1 day.)
- If underlying cause was lack of acclimatization and/or fitness level, correct this problem before athlete returns to full-intensity training in heat (especially in sports with equipment).

## How is Exertional Heat Stroke *Treated* ?

- Immediately immerse athlete in tub of cold water (approximately 35°-58°F/1.67°-14.5°C), onsite if possible. Remove clothing/equipment.
- If immersion is not possible, transport immediately. Alternative cooling strategies should be implemented while waiting for and during transport.
- Monitor airway, breathing, circulation, core temperature, and CNS status (cognitive, convulsions, orientation, consciousness, etc.) at all times.
- Place an intravenous line using normal saline.

## How is Exertional Heat Stroke *Treated* ?

### RETURN TO PLAY CRITERIA

- Physician clearance is necessary before returning to exercise.
- Severity of the incident should dictate the length of recovery time.
- Gradual return to physical activity to regain peak fitness and acclimatization under the supervision of an ATC or other qualified health care professional. Example:
  1. The athlete should avoid all exercise until completely asymptomatic and all laboratory tests are normal and the minimum of 1 week after release from medical care.
  2. Easy-to-moderate exercise in a climate controlled environment for several days, followed by strenuous exercise in a climate-controlled environment for several days.
  3. Easy-to-moderate exercise in heat for several days, followed by strenuous exercise in heat for several days.
  4. (If applicable) Easy-to-moderate exercise in heat with equipment for several days, followed by strenuous exercise in heat with equipment for several days.

## HEAT ILLNESS REVIEW

- **Most Heat Related Incidences Are Preventable**
- **General Risk Reduction Principles**
  - Educate all staff, participants and their families
  - Provide onsite medical services
  - Empower medical providers to alter practice/events
  - Obtain adequate PPPX i.e. Hx & PE
- **Specific Risk Reduction Principles**
  - Prior Hx, Inadequate acclimatization, ↓Fitness, ↑%BF
  - Intense/Long exercise, ↑Temp./Humid./Sun Expose, Inadequate work/rest ratios, Inadequate fluids

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**GO ILLINI !**

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**HEAT ILLNESS RISK REVIEW**