



Heat Emergencies

Lineboro Volunteer Fire Department

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Objectives:

- Define Heat Emergencies
- At-risk Populations
- Treatment
- Prevention



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Become familiar with what heat emergencies are and the different stages of heat related emergencies

Determine what people are most vulnerable for these types of emergencies

Discuss best practices for treating and transporting these patients

Discuss methods to prevent heat emergencies from occurring to us

What is a Heat Emergency?



- Normal body process
- Heat Production
- Body fails to cool
- Escalating levels of severity

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- Homeostasis is the body's normal function, or it's "Baseline". To maintain homeostasis, the body must maintain 98.6° F
- Inside the brain, the hypothalamus regulates body temperature to maintain that 98.6° F with the assistance of thermoreceptors located throughout the body.
- Heat is produced through normal metabolic processes, as well as voluntary large muscle movements and shivering.
- The body attempts to cool itself by increasing blood flow to the skin surface and releasing sweat onto the skin surface.
- Natural bodily systems fail to cool the body appropriately. This can be caused by internal factors such as loss of sodium or dehydration, or by external factors such as ambient air temperature and relative humidity.
- Severity of heat emergencies vary on an escalating scale, from less dangerous to lethal.

At Risk Populations



- Outdoor Workers
- Elderly
- Alcoholics / Drug Use
- Cardiac Patients

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Patients on medications which control vasoconstriction and vasodilation may have adverse affects from heat because the body's ability to shunt blood may be compromised.

Levels of Illness



- Heat Cramps
- Heat Exhaustion
- Heatstroke

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We'll go into more detail about each in coming slides. Additional terms you may hear include heat rash, a condition where body sweat irritates the skin.

Heat Cramps



- Skin Condition
 - Moist, cool
- Muscle Spasms / Cramping
 - Abdomen, arms, legs
- Body Temperature
 - Normal or Slightly Elevated

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Mildest form of heat-related emergency, most easily corrected.

Patients will present with skin that is moist and somewhat cool.

May present with pain, cramps, or spasms, typically seen in the abdomen, arms, and legs. This is caused by a metabolic change in the body that occurs when sodium leaves via sweat. The lack of appropriate sodium causes pain and cramping in the muscles.

Body Temperature may be normal or slightly elevated.

These signs may be indicators of a worsening heat condition

Heat Exhaustion



- Heat Cramps
- Nausea / Vomiting
- Dizziness
- Weakness
- Headache
- Pulse
 - Weak, rapid

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Moderate distress, will continue to progress if left untreated. Symptoms resemble those of shock and indicate that there is a problem with perfusion.

Patients will present with symptoms similar to heat stroke, with the following considerations:

Skin is cool, pale, clammy, and may even present with heavy sweating. May present with same pain, cramps, or spasms. Body Temperature may or may not be elevated.

The symptoms that differentiate Cramps from Exhaustion include the presence of nausea, dizziness, and weakness.

Heat Stroke



- Exertional or Classic
- Hot, dry, red skin
- Neurologic Changes
 - Mental Status, Seizures, Pupils
- Body Temperature
 - High
- Pulse
 - Rapid, Strong

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Most serious of all heat emergencies, and has potential to be fatal. On average, heatstroke is fatal to 4,000 Americans annually. This severity requires immediate attention.

Heat stroke can be exertional, meaning that there is a reversible cause or sorts. Exertional heat stroke occurs in healthy, young people in hot environments such as a child left in a hot car, or athletes, firefighters, or construction workers, etc. working in hot weather. Heat builds up faster than it can be removed and causes damage to the hypothalamus. These patients will likely sweat heavily. Classic heatstroke is based more on comorbid factors such as the elderly, those with underlying medical conditions, obesity, and alcohol or drugs. In these patients, heat builds up slowly over several days. Their skin typically presents hot and dry.

75% of patients in heatstroke have stopped sweating. Presence or absence of sweating alone does not differentiate severity.

Mental status will be altered and patient may appear lethargic, or confused. Seizures may occur, and pupils will dilate.

Body Temperature exceeds 103° F.

Exhaustion or Stroke?



Significant CNS involvement?
(confusion, altered mental status,
irritability, seizures)

Yes


No

Heatstroke


Heat
Exhaustion

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Mental status is the most definitive way to tell the difference between the two. Skin condition is not a reliable factor



Treatment



- Remove from environment
- Cool as appropriate
- AMS = NPO
- Rehydrate with *Electrolyte-Rich* fluid



- Initiate IV therapy, administer IV Fluid
- Temperature Monitoring (LP 15)
- Monitor EKG for changes

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Cool as appropriate. Rest in shade, drink cool fluids, lie down, loosen clothing, apply cool cloths, fanning. Ideal treatment is immersion in an ice bath. Not practical for EMS, so we add icepacks to armpits, groin, back of neck; - best places to cool due to anatomy.

Place in supine position, with feet elevated.

Assess glucose

Oxygen as needed

Treatment with water alone may cause further dehydration (dilutional hyponatremia). Explain.

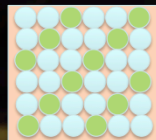
Rapid transport if needed.

Dilutional Hyponatremia

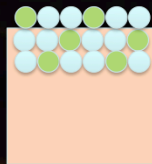


● = Water

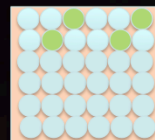
● = Sodium (salt)



Normal
Condition



Sweating



Dilutional
Hyponatremia

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Dehydration by drinking too much water.

Dilutional Hyponatremia



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Prevention



- Consume Fluids
- Thirsty
- Avoidance
- Acclimatization
- General Fitness
- Exposure Reduction

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Fluid should be consumed at a rate of 2-4 glasses per hour.

Do not wait until thirsty to drink. Thirst is not a reliable indicator of hydration status.

Avoid fluids such as alcohol, caffeine, or other high sugar beverages, as well as other fluids that may be a diuretic.

It can take anywhere from 3-10 days for the body to become acclimated to hot temperatures, and only a fraction of them to become unacclimated.

Maintain a level of personal physical fitness.

Limit exposure in high-heat circumstances when possible and maximize rest.

Review



- Discussed Heat Emergencies
- Identified At-risk Populations
- Discussed Treatment
- Discussed Prevention

QUESTIONS?

