

Heat cramps, heat exhaustion, and heat stroke. What's the difference?

They are all preventable heat-related illness, which progress in order of seriousness. They occur when our bodies have difficulty regulating temperature.

The best defense against heat-related illness is prevention!

Etiology/Pathophysiology

- The body regulates itself through the thermoregulatory system at an optimal temperature of 98.6°F (37°C).
- The body compensates in response to heating up through sweating and vasodilation (the enlargement of blood vessels) → heat dissipation
- Under conditions and multiple factors like outside temperature, humidity, sun exposure, clothing, dehydration, alcohol use, our body temperature cannot regulate itself and will heat up rapidly, which can result in a medical emergency

Knowing and identifying the difference

1) Heat Cramps

- usually the first sign of heat exhaustion
- pain and cramping in the legs and a feeling of tiredness—caused by dehydration and electrolyte imbalances

2) Heat Exhaustion

- Occurs when body temperature rises above 38.0°C (100.4°F) due to difficulty cooling itself
- Water volume depletion due to excess sweating in hot weather without hydration worsens symptoms

3) Heat Stroke

- At this stage, the body **cannot** regulate its temperature and is considered a medical emergency—above 40.5°C (104.9°F)
- The only effective treatment is cold IV (intravenous) fluids done by emergency medical personnel at the scene or at the hospital
- Children under five, elderly, obese people, and people with chronic conditions (cancer, kidney disease, diabetes, heart conditions, and skin diseases) are at a higher risk
- Onset sometimes comes without warning

Symptoms:

1) Heat Exhaustion

- Skin → Cool, moist, or sweaty skin that is pale or flushed
- Symptoms → Fatigue, weakness, dizziness, nausea, chills, vomiting

2) Heat Stroke

- Skin → Red, hot, dry skin—body has stopped sweating to conserve fluids, rapid pulse
- Symptoms → Headache, dizziness, fatigue, confusion, delirium
- More serious symptoms if left untreated → unconsciousness, seizure

Complications of Heat Stroke

- If body temperature is not brought down fast enough/left untreated, multiple organs can be affected including the central nervous system, heart, liver, and kidneys
- Complete recovery can range from two months to a year
 - A preventable consequence is the delay in cooling down the body
 - Depends on how quickly one recognizes the signs/symptoms and take action

Who gets it?

Risk factors: What can exacerbate heat exhaustion/stroke

- Lack of access to drinking water.
- Overdressing on a hot day.
- Medication that increases risk for dehydration
 - antidepressants
 - sedatives
 - antihistamines
 - prednisone- a steroid used to treat many different things
 - antipsychotics
 - diuretics
- Alcohol and street drugs
 - Make sure to drink water while drinking in the sun!
- Certain medical conditions:
 - heart conditions, respiratory, skin, kidney, mental illness, diabetes, infections, diarrhea, vomiting, etc
- Doing physical activity on a hot day
- Young or old age (younger than 4 and older than 65)
- Obesity
- High humidity

What can be done? *If possible include both traditional medical therapies and alternative strategies/at home methods ex: medication AND diet modifications or relaxation exercises for high blood pressure

How to look for signs:

- Heat cramps: If someone has been exercising or doing strenuous work/activity in hot environments => muscle spasms that are prolonged and intense (areas often affected: calves, arms, abdominal wall/back...)
- Heat exhaustion: Person who has been exposed to high temps. and have become dehydrated => heavy sweating, excessive thirst, headache, nausea, dark colored urine.
- Heat stroke (most severe): If someone has had prolonged exposure to high temp. for a long period of time, in combination with dehydration => Core body temp. above 105 degrees Fahrenheit; fainting may be the first sign. Other signs may include headache, dizziness, red/hot/dry skin, and rapid breathing and heart-beat.

Treatment:

- Heat cramps: Rest and cool down, drink electrolyte containing sports drink (ex. Gatorade) & water, stretch, gently massage area [call doctor if cramps don't go away within an hour or so.
- Heat exhaustion: Get person to rest in a cool place, drink fluids, use cool water on skin and loosen clothing (increase ventilation) [Don't get better within 30 min of treatment, take to hospital].
- Heat stroke: Call 911 or transport person to hospital! While waiting for paramedics or during transport, cool the person down: moving to a different (shady, AC) location, drink some water, use ice packs under armpits, cover body with damp cloth etc. Hospital treatment: Immersion in ice bath and spraying body with mist of cool water in combo with warm air fanning over body.

Prevention:

The best defense!

Before and during exposure to hot environments:

- Drink lots of fluids (water, non-alcoholic, non-caffeinated, low sugar)
- Wear light weight and color clothing
- If exercising/outdoor activity, be sure to rest and and drink water periodically

- If it's really hot (high 90s), stay indoors where there is AC or in the shade.
- Protection from sun: wear a hat, sunglasses

Suggested Activities:

- Urine color - indications for dehydration. Add food coloring to water bottles to demonstrate different levels of dehydration and discuss possible implications of each.

- Prepare “urine” before session starts
- Have participants rank them by severity
- Discussion about implications of each color stage

- Find a video showing scenarios of heat exhaustion/stroke:

<https://www.youtube.com/watch?v=zKDC1DPfVlc>

Discussion Questions:

After the video → Talk about a real life scenario

Resources Available:

Pamphlets on Heat Emergencies –

<http://www.kingcounty.gov/healthservices/health/personal/HCHN/brochures.aspx>

Sources:

More in-depth medical information on heat-related illnesses:

<http://www.aafp.org/afp/1998/0901/p749.html>, American Academy of Family Physicians

Hot weather tips and extreme heat prevention guide:

<http://www.bt.cdc.gov/disasters/extremeheat/>, CDC