

EM CASE OF THE WEEK.

BROWARD HEALTH MEDICAL CENTER
DEPARTMENT OF EMERGENCY MEDICINE



Care Warriors

Author: Krishna Suri | Editor: Benita Chilampat, DO, PGY-II

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Heat Stroke

75-year-old male with past medical history of hypertension and diabetes presents to the ED after a syncopal episode. He has never experienced these symptoms before. He has been out of power and air conditioning in his house for the past week. Patient is febrile with a temperature of 105.3, tachycardic with a pulse of 115, and hypotensive with a blood pressure of 85/47. On physical exam, the patient seems to have an altered mental status and is agitated. His skin is flushed and crackles are heard in the lower lung fields bilaterally. Which of the following is the most appropriate initial treatment for this patient's condition?

- A. Administered chilled IV normal saline
- B. Intubate immediately
- C. Remove all clothing and apply cold packs to the neck and axilla
- D. Gastric lavage with ice water
- E. Administer IV antibiotics



Differential Diagnoses:

Environmental:

Heat stroke

Infectious:

Sepsis

Meningitis

Endocrine:

Thyroid storm

Iatrogenic

Neuroleptic Malignant syndrome

Anti-cholinergic poisoning

EM Case of the Week is a weekly "pop quiz" for ED staff.

The goal is to educate all ED personnel by sharing common pearls and pitfalls involving the care of ED patients. We intend on providing better patient care through better education for our nurses and staff.

BROWARD HEALTH MEDICAL CENTER

Department of Emergency Medicine
1625 SE 3rd Avenue
Fort Lauderdale, FL 33316

The correct answer is C.
Remove all clothing and apply cold packs to the neck and axilla

Heat Stroke

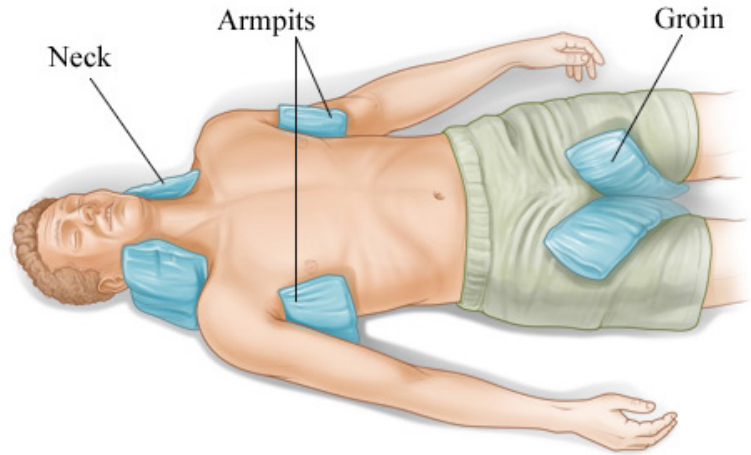
Heat stroke is defined by body temperatures in excess of 104 degrees with concomitant organ system dysfunction (especially the CNS). This occurs in an environment that is especially hot and which does not allow easy cooling. This occurs due to an imbalance between environmental heat and our physiologic mechanisms for coping. The elderly are especially susceptible due to reduced capacity to vasodilate and dissipate heat from the epidermis.

Clinical Presentation

Generally heat shock can be split into two different varieties: Exertional and Non-exertional. Exertional heat shock classically presents in a younger patient with prolonged exposure to an extremely hot environment, such as a football player or military recruit. Non-exertional heat shock generally presents as an older individual, usually with one of several predisposing conditions such as cardiovascular disease that hinder their ability to compensate for hot surroundings. Patients, in addition to greatly elevated body temperature, present with altered mentation, weakness, lethargy, dizziness. With increasing severity, patients may even have pulmonary edema, acute kidney injury, and disseminated intravascular coagulation.

Diagnosis

- Rectal Temperature
- CXR
- CBC
- CMP
- PT/INR
- PTT
- CPK
- ABG



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Via (<http://www.webmd.com/first-aid/placement-of-ice-bags-for-heatstroke>)

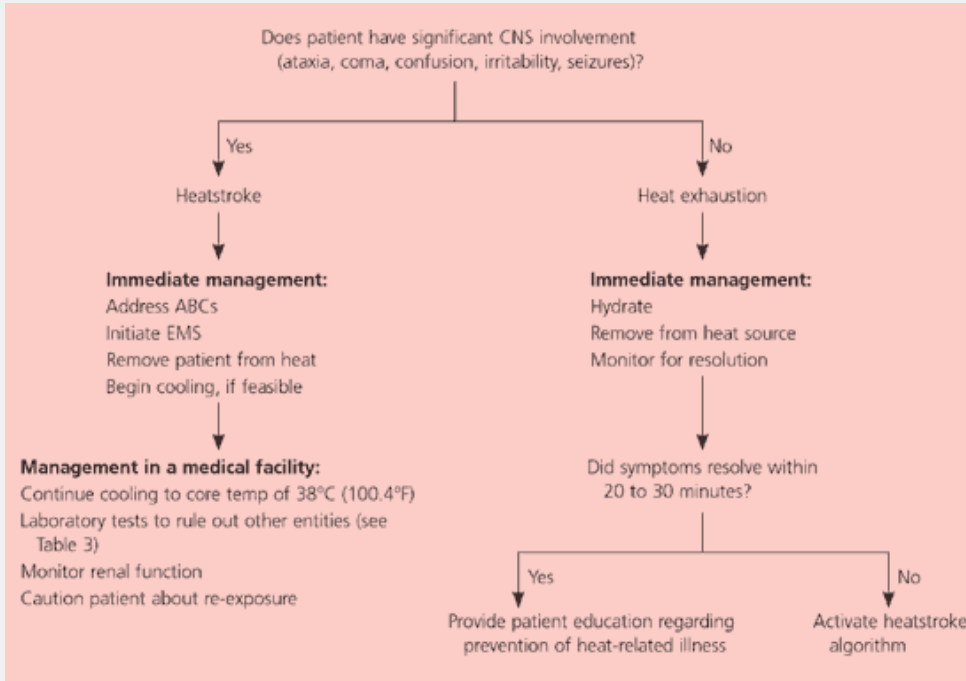
Treatment

As with most measures of initial treatment it is important to address airway, breathing, and circulation. It is important to intubate if necessary, get an accurate measure of volume status, treat with IV boluses of isotonic saline, and obtain continuous temperature monitoring with a rectal/esophageal probe. Next, treat the patient with immediate cooling. It is important to strip the patient down and then proceed with one or more techniques. The patient can be laid down and have ice packs applied to the neck, groin, and axilla. The patient can be sprayed with a lukewarm mist and cooled with fans. Thoracic or peritoneal lavage are techniques for extremely rapid cooling, however such techniques are invasive and are not first line remedies. Pharmacologic therapy has been noted to be largely ineffective in the treatment of classic or exertional heat stroke (dantrolene or antipyretic agents such as acetaminophen). Finally, it is important to continue to monitor diagnostic values to watch for organ damage.

For a list of educational lectures, grand rounds, workshops, and didactics please visit BrowardER.com and **click** on the **“Conference”** link.

All are welcome to attend!

Heat Stroke Algorithm



Heat Stroke vs Heat exhaustion: As opposed to heat stroke, heat exhaustion presents with temperatures <104 degrees Fahrenheit and with more nonspecific symptoms such as headache, fatigue, and weakness. Generally, significant dysfunction of the central nervous system is not present.(2)

Take Home Points

- Heat stroke occurs when our homeostatic mechanisms for maintaining body temperature are overcome in individuals with prolonged exposure or who are more susceptible to elevations temperature.
- Mortality secondary to heat stroke can be high in the elderly and is proportional to the extent of organ damage.
- Diagnosis is generally based off of rectal temperature values of >104 degrees Fahrenheit in addition to parameters of cardiac, renal, pulmonary, and hepatic dysfunction.
- Management includes addressing the ABC's and subsequently utilizing a variety of established cooling methods.



ABOUT THE AUTHOR

This month's case was written by Krishna Suri. Krishna is a 4th year medical student from NSU-COM. He did his emergency medicine rotation at BHMC in September 2017. Krishna plans on pursuing a career in Internal Medicine after graduation.

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