

Clinical Pathway: Heat Related Illness

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Primary Sources: 1. Barletta, J.F., et al. Society of Critical Care Medicine Guidelines for the Treatment of Heat Stroke. Crit Care Med. 2025 Feb 1;53(2):e490-e500. doi: 10.1097/CCM.0000000000006551. Epub 2025 Feb 21. PMID: 39982186. 2. Cheshire WP Jr. Thermoregulatory disorders and illness related to heat and cold stress. Auton Neurosci. 2016 Apr;196:91-104. doi: 10.1016/j.autneu.2016.01.001. Epub 2016 Jan 6. PMID: 26794588. 3. Kanda J, et al. Association between active cooling and lower mortality among patients with heat stroke and heat exhaustion. PLoS One. 2021 Nov 17;16(11):e0259441. doi: 10.1371/journal.pone.0259441. PMID: 34788312; PMCID: PMC8598059. 4. Sorensen C, Hess J. Treatment and Prevention of Heat-Related Illness. N Engl J Med. 2022 Oct 13;387(15):1404-1413. doi: 10.1056/NEJMcp2210623. Epub 2022 Sep 28. PMID: 36170473.

Active vs. Passive Cooling

Active:

- Cold Water Immersion (1-17°C)
- Tarp with Cold Water
- Cold shower
- Ice sheet cooling
- Fan cooling
- Cold Intravenous Saline
- Commerical Ice Packs (neck, axilla, groin)
- Evaporative Cooling (Misting and Fanning)

Passive:

- Move Patient to a cooler environment
- Rest patient in supine position
- Oral Rehydration
- Remove excess clothing

***Clinical Signs of Central Nervous System Dysfunction**

- Delirium
- Confusion
- Hallucinations
- Coma
- Seizures

Applicable to:
Adult patients with concern for heat stroke, heat exhaustion, or minor heat injury

Exposure:
(environment, exertion, clothing, hydration)
Vital signs (Tcore, BP, HR, RR)
Neuro Exam

Temperature: < 38 °C, no CNS dysfunction;
may have rash (miliaria), cramps, syncope, edema

Minor Heat Injury

Managment

- Remove from heat; rest in cool environment
- Oral hydration with electrolyte solutions
- Cool compresses to skin (fanning + misting if available)
- Labs necessary if repeated or chronic exposure (e.g. unhouseed or occupational exposure)

Rash or Pruritus:

- Topical low-potency corticosteroid or Antihistamine Cream

Cramps:

- Oral Salt + Fluid Replacement

Disposition

- Observe until symptom resolution (usually hours)
- Discharge with advice on hydration, acclimatization, and warning signs

Temperature: < 40 °C, no CNS impairment, systemic symptoms (weakness, nausea, tachycardia)

Heat Exhaustion

Diagnostics

- Labs indicated if atypical or persistent vomiting, repeated or chronic exposure (e.g. unhouseed or occupational exposure)
- Usually, labs or imaging is not required

Managment

- Remove clothing; move to cool environment
- IV crystalloid bolus (e.g., 1 L NS) if hypotensive or unable to tolerate PO
- Oral rehydration with electrolyte solutions once tolerated
- Active cooling: fanning + tepid misting

Persistent Hypotension, Vomiting, or Comorbidities

Admit

Disposition

- Observe until stable (vitals normalized, able to hydrate)
- Discharge with close follow-up

Temperature: ≥ 40 °C and any CNS dysfunction*

Heat Stroke

Diagnostics

- Stat labs: CBC, CMP (incl. LFTs), CK, coagulation panel, UA

Arrhythmias or Myocardial Injury

ECG

Focal Neurological findings or Uncertain etiology

CT brain

Managment

- **Airway/Breathing:** support as needed; consider paralytic (rocuronium) to prevent shivering
- **Circulation:** IV crystalloid (1–2 L NS bolus), vasopressors if refractory
- **Rapid Cooling** (start immediately):
- **Preferred:** Active cooling: cold-water immersion (1–17 °C) until Tcore ≈ 39 °C (102.2 °F)
- **Alternative:** evaporative cooling (spray + high-velocity fanning) aiming for Tcore ≈ 38 °C (100.4 °F)
- Supplemental: ice packs rotated over major vessels, cooling blankets, cold IV fluids
- **Monitor:** continuous Tcore, cardiac, neuro status

Disposition

- Admit to ICU for continuous monitoring, serial labs (renal, hepatic, coagulation), fluid management
- Watch for complications: DIC, rhabdomyolysis, AKI, liver failure, CNS injury
- No antipyretics or dantrolene