

Special situations

MANAGING THE PATIENT WITH HYPERTHERMIA

Extremely elevated body temperature can be the result of endogenous or exogenous causes.



Causes

Endogenous causes include medication effects (e.g., malignant hyperthermia, serotonin syndrome, neuroleptic malignant syndrome), infection, thyrotoxicosis, or brain injury.

Exogenous sources are classified as a spectrum of illness, and collectively referred to as heat-related illness. The most severe form is often called **heatstroke**, which is defined as a body temperature $> 40^{\circ}\text{C}$ (104°F).

Exogenous hyperthermia and medication-induced causes are the most likely to result in end-organ injury.

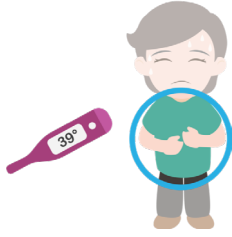
Treatment

Management of hyperthermia should begin with eliminating the source, when possible. This may mean discontinuation of a medication, control of an infection, or removal from a hot environment.

Cooling measures should be implemented when body temperature is elevated and associated with symptoms (e.g., altered mental status, lack of sweating, seizures, rhabdomyolysis, renal failure, etc.). The most effective form of cooling is ice bath immersion, but this has several logistical considerations in a hospital environment and may not be practical.



Misting to promote evaporation is more effective with tepid water than cold water, which may promote vasoconstriction of the skin. Cooling in this way may be augmented with the use of fans to circulate the air. Clothing should be removed when possible to promote skin exposure and increase the surface area available for evaporative cooling.



Core temperature should be monitored, using an indwelling thermometer (e.g., rectal, esophageal, or urinary catheter, if urine output is > 30 mL / h). Cooling measures may disproportionately affect more superficial areas (e.g., mouth, axillae), resulting in falsely low measurement.



Medication-related causes of hyperthermia may be treated with **dantrolene** (malignant hyperthermia), **cyproheptadine** (serotonin syndrome), or **bromocriptine** (neuroleptic malignant syndrome), as appropriate.



Nearly every patient with hyperthermia will be dehydrated, and benefit from **IV fluid** repletion. Careful attention should be paid to **electrolyte abnormalities**, which are also likely to be present.

It is also important to avoid overshooting, or cooling past a normal temperature, and causing iatrogenic hypothermia.