

THERMOREGULATION

Thermoregulation is the term for the body's ability to maintain its core temperature (i.e., heart, lungs and brain) within specified boundaries. Normal core temperature ranges between 36.5° C and 37.5°C. This control is primarily provided by a portion of the brain called the **hypothalamus** which initiates a variety of responses to temperature fluctuations signaled by temperature receptors in the skin and core.

When the body is too warm, one cooling response is **vasodilation** which expands the blood vessels to increase blood flow to the periphery. This process may also be accompanied by sweating (another cooling response).

When the body is too cool, body heat is preserved: **vasoconstriction** narrows blood vessels to decrease blood flow to the extremities (hands/feet) and therefore decrease heat loss.

Shivering Thermogenesis

Goal:

- ⌚ Prevent hypothermia
- ⌚ Slow onset of hypothermia
- ⌚ Power rewarming



The brain may also initiate shivering **thermogenesis** to generate more heat. Shivering is an extremely effective means of creating body heat. At rest, we normally generate approximately 100 watts of heat. But when vigorous shivering occurs in the early stages of cold exposure and mild hypothermia, it can increase heat production up to 500 watts. Shivering is a good thing—it not only slows the

onset of hypothermia but can also be an important aid in post-rescue rewarming.



When attempting to aid a potentially hypothermic victim, given the choice of drink, it would be better to offer a cold drink with sugar (to fuel shivering) than give them a warm drink that relies only on heat for rewarming (like warm water). The best possible option would be a warm chocolate drink that provides both heat and energy. Note: Be careful, however. Fluids should only be provided in cases of mild hypothermia where the victim is conscious, alert and won't choke.