

# Heat and cold intolerance (thermoregulation)

- **The ability to keep your temperature at a normal level is called thermoregulation.**
- **You may experience heat or cold intolerance as a result of polio.**
- **There are things you can do to keep warm or cool and government concessions on energy bills to assist you.**

Many polio survivors report that their feet or hands have always been cold to the touch, and their skin can turn a bluish colour. During months of hot weather, you may find it hard to keep cool.

## Heat and cold intolerance (thermoregulation)

Thermoregulation is the process that allows your body to keep its core internal temperature. The body responds to temperature through:

- **nerves** that control blood vessel size, constricting when it is cold or relaxing when it is hot.
- **nerves** that help concentrate blood flow to the centre during times of digestion or to our limbs during movement.
- **skeletal muscle activity** where blood is transported to muscles and to the skin surface vasodilation occurs.

## How is body heat maintained?

- Muscle activity stimulates blood flow (and heat) to the limbs, away from internal organs.
- The cells in and around the muscle produce heat from the muscle activity.



- Excess heat is lost by allowing more blood flow through the capillaries closer to the skin surface.

## Hypothalamus

The hypothalamus is located at the base of the brain and acts as a thermostat for our body. When body temperature falls outside “normal” ranges, the hypothalamus becomes involved. It helps body functions such as temperature, hunger, thirst, fatigue and sleep. The hypothalamus may have been damaged from the poliovirus. It is not clear how much damage happened, and is different for each person.

The hypothalamus does not function as well in areas with muscle weakness as there is less capacity for it to stimulate nerves.

Consider a polio survivor with a weak left leg from polio. They may describe feeling the cold in their left foot more than other parts of their body. This is mainly due to less heat created from reduced muscle activity.

You may experience a greater loss in heat due to a delayed response to a change in environment. For example, when you are in the sun, the skin warms up and the body temperature increases. Blood vessels relax, or dilate and the foot and limbs appear red in colour. When you move to a cold environment, there may be delay in reducing blood vessel size in the leg and foot where it was affected by the poliovirus. This leads to heat loss as warmth that had been at the skin surface is lost rather than moved away from the skin surface as quickly as other areas with greater nerve supply in the body.

Skeletal muscle activity plays a big part to warm up the body. Where there is paresis or significant weakness, it is not possible for muscles to regularly contract to help retain or increase heat. As a result, you may notice your foot turns blue in colour over time.

You also need to be mindful of the reduced blood flow response, especially if they have had the same postural position (e.g. sitting) for long periods. This can result in blood pooling in the lower half of the body. A symptom of this is dizziness, particularly when standing, and is a risk factor for falls (please see Falls Prevention fact sheet).



## Management

The treatment of heat and cold intolerance is focused on managing the symptoms. There are no medications or other types of clinical interventions to treat this. You should keep your home at the right temperature for you and well insulated; see available Medical Cooling and Heating Concessions.

### Cold Intolerance Tips

- Wear multiple layers of clothing
- Wear heat-retaining socks and undergarments made of wool or polypropylene, e.g. Gore-Tex or Thinsulate
- Put on clothes straight after showering when the skin is warm
- Apply heat pads (for no more than 20 minutes)

### Heat Intolerance Tips

- Use personal cooling products, such as: neck wrap, vest, hat, pillow, and sleeping pad

### More Information

- Speak to your general practitioner
- See available **Medical Cooling and Heating Concessions**

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