

## **Cold Intolerance**

Many polio survivors report that their feet have always been cold to the touch, their skin a purplish color. As they age, their limbs become more sensitive to pain as the temperature decreases (Owen, 1985). When polio survivors were cooled in the laboratory from 86° F to 68° F, motor nerves functioned as if they were at 50° F, and survivors lost 75% of their hand muscle strength (Bruno et al., 1985).

The body's thermostat, the area of the brain that causes blood vessels to contract, and the hypothalamus, the part that controls the body's inner environment, may have been affected during the original poliovirus infection. Also affected were sympathetic motor nerves in the spinal cord that send the message to the capillaries of the skin to contract when it is cold (Bodian, 1949). Consequently, as the outside temperature drops, the capillaries do not contract and warm blood flows to the surface of the skin resulting in excessive loss of heat and cooling of the limbs. When the limbs cool, veins narrow, trapping venous (blue) blood in the capillaries. This causes the feet to look blue. The motor nerves of cold limbs conduct more slowly; the muscles contract less efficiently. Cold also chills tendons and ligaments (like putting a rubber band in the freezer), making them stiff and movement of weak muscles more difficult.

Blood vessels do exactly the opposite of what they do in the cold during a hot bath. Heat causes the arteries to relax, and oxygenated (red) blood rushes to the skin. It becomes bright red. Survivors are advised to be cautious when getting out of the bathtub because blood can suddenly pool in the legs and can cause a drop-in blood pressure resulting in dizziness or even fainting (Bruno, 1996). Chronic pooling of blood in the legs causes foot swelling (**see Foot Swelling**) and increases with age.

Other recommendations related to cold intolerance include: dress as if it were 20° F colder, dress in layers and wear heat-retaining socks or undergarments made of polypropylene (e.g., GortexT or ThinsulateT) or wool, and put on clothes immediately after showering when the skin is warm. Electromyograms (**see Electromyography**) or nerve conduction tests must be performed in a room that is at least 75° F to prevent abnormal readings, and limbs should be warmed as needed before testing (Maynard, 1985). Heated blankets may be necessary in the recovery room after surgery (Bruno, 1996).

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