

ASK EXPLORE

## Numb thumbs syndrome

**Q** On a recent cross-country ski excursion, I came in from the cold to grab a bite to eat. My hands were perfectly warm and comfortable while skiing and during the break. But once I went outside again and resumed skiing, my hands were very cold. Why does this happen?

—Amanda Knight

**A** Most of us understand Temperature Regulation 101. In the cold, the body prioritizes thermal protection of its core. The constriction of blood vessels (vasoconstriction) in the hands and feet decreases blood flow to the extremities, thereby decreasing heat loss from hands and feet and preserving core temperature. This is when your fingers take on that familiar and unpleasant club-like feeling.

The start of exercise initiates a classic battle for resources. The fingers and toes require blood-borne heat while the exercising muscles crave oxygen, which is supplied by blood flow. The greedy muscles have more friends in high places and blood flow is diverted to the legs. The poor fingers just can't catch a break, at least, not right away.

As core temperature gradually rises, the body finally decides to get rid of some of this excess heat. The blood vessels dilate (vasodilation) so that blood flow to the extremities actually increases and voila, your fingers and toes get that warm, fuzzy feeling again.

—Gordon Giesbrecht

Got a question for one of our experts? Send it to: [explore@explore-mag.com](mailto:explore@explore-mag.com)



KNOW HOW

## Beating Old Man Winter

Advice from Dr. Cold on staying warm and alive

If anybody knows the cold, it's Gordon Giesbrecht. Not only is Giesbrecht a professor of thermophysiology at the University of Manitoba, but he's also made four expeditions on frozen Lake Winnipeg in preparation for a planned 2006 trek to the North Pole. We asked him for his tips on staying warm and surviving the elements this winter.

**FAT IS YOUR FRIEND**  
Calories fight hypothermia—and fat packs twice the caloric punch per gram of carbs or protein. Giesbrecht likes to melt a quarter cup of butter into his meals while on an expedition. "If you are out for a week or more, double or triple your caloric intake," Giesbrecht says. "You need 3,500 to 5,500 calories a day to stay warm out there."

**STAY IN TOUCH WITH YOUR FEELINGS**  
Numb fingers are "a dire warning," Giesbrecht cautions. Frostbite can take you unaware because cooling nerves stop functioning at about 7°C. First, you feel cold, then pain, then numbness, then nothing. If your hands turn numb, you can warm them in your armpits. Treat frostbite (only if you are certain the tissue won't refreeze) by immersion in warm water until the skin becomes flushed. Never

rub affected areas or thaw them over a fire.

**DON'T SWEAT IT**  
Giesbrecht outlines a typical scenario: You're skiing with a parka. You start to sweat, but don't want to stop to layer down. Eventually you do take it off because you're hot. Soon, you're freezing, so the parka goes back on and you ski unhappily along. To avoid this vicious cycle, he suggests stowing the jacket from the start. You'll feel cool, but you'll soon warm up and will stay much drier.

**WATER DAMAGE**  
On his first expedition Giesbrecht's sleeping bag gained half a pound of water a day until it was a veritable ice cube. Vapour escapes from your skin then hits the dew point. If that happens inside your sleeping bag, it freezes. You can try using a vapour barrier, but that's like sleeping in a Baggie. To avoid that Saran-Wrapped sensation, Giesbrecht recommends

adding a thin overbag. The extra layer increases the insulation, drawing moisture out so it reaches the dew point between the two bags. Ice crystals still form, but between the two layers—just brush them off.

**SITUATION CRITICAL**  
If you fall through the ice, hypothermia won't kill you right away, but drowning could, so it's vital to control your breathing in the first minute. You still have 10 to 15 minutes before your body is immobilized by the cold. Put your arms on the ice and flutter kick until you're horizontal to the surface, pulling yourself along and out of the water, then roll away and crawl. If you don't succeed, you still have an hour before passing out. At this point, the trick, once again, is not to drown. You may still have another hour before your heart fails. Put your arms on the ice and don't move. If you're lucky, you'll be found alive, frozen to the ice. —Kate Barker