

Winter Survival

What is Dangerously Cold

Never, ever tell a Iowan not to go outside because it's too cold out. In all candor, when properly dressed, even a subzero wind can be invigorating and downright stimulating. Does it ever get too cold? What follows is a rough guide to remember when Canada begins to leak thumb-numbing air south of the border.

- ρ **-25° windchill** Not terribly dangerous if properly dressed with multiple layers of clothing and protective headgear. Being physically active reduces the risk of frostbite even more.
- ρ **-50° windchill** Exposed flesh can freeze in under a minute or two. The elderly, people with circulatory problems, and babies should remain indoors.
- ρ **-70° windchill** Dangerous, even if properly dressed. Everyone should stay inside until the winds die down.

The Perils of Winter Cold

- ρ **Frost Nip** The cold stops blood flow to your fingers, toes, ears and nose. These extremities begin to tingle and hurt.
- ρ **Frost Bite** This is more serious than frost nip. When frost bite sets in, the pain and tingling go away and tissue damage begins. Damage can be on the surface or deep within. See a doctor right away for treatment. For first aid treatment, immerse area for 20-45 minutes in tepid (98°-104°) water. Avoid using hot water which may burn the area, causing more damage.
- ρ **Hypothermia** The most severe winter injury. Hypothermia victims are freezing to death and are either groggy or unconscious. Wrap the victim in blankets immediately, and get to a hospital.

More About Frostbite

What is frostbite?

Frostbite is really the combination of wind and cold temperatures attacking less than adequately protected skin. This can happen if one is stranded in the bitter cold, or if it's cold enough, it can occur just crossing the street. The areas most likely to get frostbitten are ears, noses, fingers and toes. The extent of injury caused by exposure depends on wind velocity, duration and type of exposure, temperature and humidity.

Frostbite results when crystals form, either superficial or deep, in the fluids and underlying soft tissues of the skin. The effects of frostbite are more severe if the injured area is thawed and then refrozen.

Just before frostbite occurs, the affected skin may be slightly flushed. As frostbite develops, the skin appearance changes to white or greyish-yellow. Pain is sometimes felt early but subsides later (often no pain is felt). Blisters may appear. The affected part feels intensely cold and numb. The victim frequently is not aware of frostbite until someone points out the change in skin color—pale, glossy skin or the victim sees the skin changes and feels the pain of frostbite once inside, away from cold exposure.

What can you do for frostbite?

Remove wet or frozen clothing or anything that constricts frostbitten area. Protect the affected area from further injury and rewarm affected area rapidly by immersing body part in water that is lukewarm, not hot. If the affected part has been thawed and refrozen, it should be warmed at room temperature 70-74 F. Do not rub affected part, as rubbing can cause further tissue injury. Once the affected part is rewarmed, have the victim lightly exercise it. If warm water is not available, wrap the affected part gently in a sheet and warm blankets. Or, cold hands, for example, may be given some relief by placing them under dry clothing against the body, such as in the armpits.

How can you prevent frostbite?

Prevention involves limiting the duration of, if not avoiding exposure to extreme cold and wearing proper protective clothing (e.g. head and ear coverings, extra pair of socks, warm boots, wind- and water-repellent material and loose fitting layered clothing). The danger of frostbite is increased if you are tired, have had a recent cold (body resistance is lowered), or have consumed alcoholic beverages or drugs (increased heat loss and distortion of senses and/or time can occur).

How to Stay Safe and Warm

Numerous layers of clothing will keep you warmer than one big, bulky overcoat. An undershirt, shirt, sweater, and jacket will trap your body heat more effectively, leaving you warm and tasty.

- ρ Wear a hat, something that will cover your ears! Studies have shown that 50 to 75 percent of the heat escaping your body leaves through the top of your head.
- ρ Mittens or ski gloves will leave you warmer than ordinary gloves
- ρ This may sound like common sense, but try to keep your clothes dry. Damp clothing conducts the cold much more effectively, leaving you chilled to the bone. If you get wet, change into another pair of warm, dry clothes. You'll stay much happier when the windchill hovers below zero.

Clothing Materials

Some of the different types of materials for winter clothing and insulation are discussed below.

- 1. Wool** - derives its insulating quality from the elastic, three-dimensional wavy crimp in the fiber that traps air between fibers. Depending on the texture and thickness of the fabric, as much as 60-80% of wool cloth can be air. Wool can absorb a fair amount of moisture without imparting a damp feeling because the water "disappears" into the fiber spaces. Even with water in the fabric wool still retains dead air space and will still insulate you. The disadvantage to wool is that it can absorb so much water (maximum absorption can be as much as 1/3 third the garment weight) making wet wool clothing very heavy. Wool releases moisture slowly, with minimum chilling effect. Wool can be woven in very tight weaves that are quite wind resistant. However, it can be itchy against the skin and some people are allergic to it.
- 2. Fleece fabrics** - is a synthetic material often made of a plastic (polyester, polyolefin, polypropylene, etc.). This material has a similar insulating capacity to wool. Its advantages are that it holds less water (than wool) and dries more quickly. This allows for numerous layering possibilities. The disadvantage of pile is that it has very poor wind resistance and hence a wind shell on top is almost always required.
- 3. Polarguard, Hollofil, Quallofil and others** - these are synthetic fibers which are primarily used in sleeping bags and heavy outer garments like parkas. The fibers are fairly efficient at providing dead air space (though not nearly as efficient as down). Their advantages are that they do not absorb water and dry fairly quickly. Polarguard is made in large sheets. Hollofil is a fiber similar to Polarguard but hollow. This increases the dead air space and makes the fiber more thermally efficient. Quallofil took Hollofil one step further by creating four "holes" running through the fiber.
- 4. "Superthin" fibers - Primaloft, Microloft, Thinsulate and others** - Under laboratory conditions a given thickness of Thinsulate is almost twice as warm as the same thickness of down, however, the Thinsulate is 40% heavier. Thinsulate is made in sheets and therefore tends to be used primarily for outer layers, parkas and pants. New materials such as Primaloft and Microloft are superthin fibers that are close to the weight of down for an equivalent fiber volume. They are now being used in parkas and sleeping bags as an alternative to down. They stuff down to a small size and have similar warmth to weight ratios as down without the worries about getting wet.
- 5. Down** - feathers are a very efficient insulator. They provide excellent dead air space for very little weight. The major problem with down (and it can be a major problem) in the winter is that down absorbs water. Once the feathers get wet they tend to clump, and lose dead air space. Using down items in the winter takes special care to prevent them from getting wet. Some people are allergic to down.
- 6. Cotton** - is basically useless in winter time.