

too cold!



Staying Warm in the Winter

When winter arrives
it doesn't mean an end
to enjoying the outdoors.

Staying active during the winter months is essential! Instead, it's important to keep warm while working or playing outside when the temperature drops. Many deaths related to temperature are caused by exposure to cold conditions.



While cold-related injuries vary from person to person, we know that some individuals are more vulnerable to cold, including



- the very young
(children less than one year of age)
- the elderly
- persons with diseases of the blood circulation system
- anyone who may suffer injuries that result in blood loss or altered blood flow
- anyone with previous cold injuries
- individuals who suffer from fatigue
- the consumption of alcohol or nicotine, and use of certain drugs or medication
- people who remain outdoors for long periods of time
- people with inadequate caloric intake

Uncomfortably cold working conditions can lead to lower work efficiency and higher accident rates. If you must do work outside during the cold and you have heart disease or high blood pressure, consult your physician first. Otherwise, if you have to do heavy outdoor chores, dress warmly and work slowly—your body is already working hard just to stay warm, so don't overdo it.



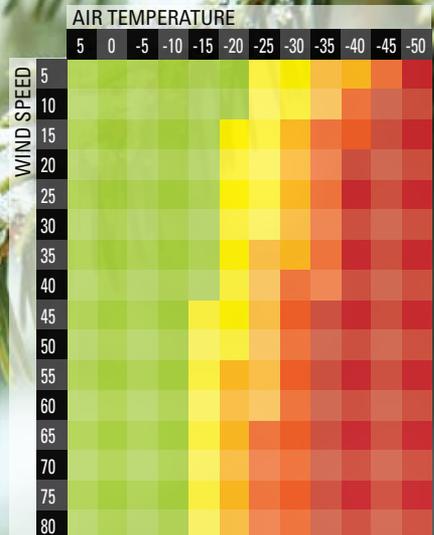
If you are organizing an outdoor event, be sure to check the weather conditions, before and during, to ensure that you and the participants are adequately prepared.

Weather conditions can be checked at the Environment Canada Weather Office here: weather.gc.ca/canada_e.html

Environment

A cold environment challenges people in three ways: by **air temperature**, **air movement** (wind speed), and **humidity** (wetness). The combined effect of cold air and wind speed is expressed as “wind chill”. The wind chill can be used for deciding what to wear and any possible health effects you may experience because of the cold. The chart below shows how the temperature and the wind create “wind chill”.

- Low risk of frostbite for most people.
- Increasing risk of frostbite for most people within **30 minutes** of exposure.
- High risk for most people in **5 to 10 minutes** of exposure.
- High risk for most people in **2 to 5 minutes** of exposure.
- High risk for most people in **2 minutes** of exposure or less.





Keep active! Ration your sweat, not your water!

What is important to recognize is that there is a strong connection between fluid levels and heat loss. In cold temperatures the fewer fluids you have in your body, the easier it is to catch hypothermia and other cold injuries, for which medical attention should be given.

There are four main ways in which our bodies lose heat to the environment. They include

Radiation – when you lose body heat to the environment because of exposed skin. The more skin that's exposed the quicker you lose heat.

Conduction – when you lose body heat through direct contact with a cooler object including cold air. For example, wearing wet clothing increases heat loss by five times.

Convection – when you lose body heat to the surrounding air as the air moves across exposed skin.

Evaporation – when you lose body heat because water from sweating turns from a liquid to a gas.



Hypothermia

Hypothermia is when the body can't compensate for the heat loss escaping from the body, and the core temperature starts to fall. This is a dangerous condition because it can happen slowly without the person knowing. Symptoms include shivering, goose bumps and numbing of the hands, to more severe cases including difficulty speaking, frequent stumbling, exposed skin appears blue and puffy and if the core body temperature continues to fall, death.

Frostbite

Frostbite is caused by exposure to extreme cold or by contact with extremely cold objects, which causes the freezing of tissue like skin. Symptoms include inflammation of the skin in patches with slight pain. In severe cases, there could be tissue damage without pain, or there could be burning or prickling sensations which turn into blisters. Frostbitten skin is highly susceptible to infection, and gangrene may develop (this is when soft tissues die due to loss of blood supply).

Other types of cold injuries include

Chilblains occur from exposure to several hours of air temperatures from 0 degrees Celsius to about 16 degrees Celsius. The affected area of the skin may experience redness, swelling, tingling and pain.

Trenchfoot is a “wet cold disease” resulting from long-term exposure in a damp or wet environment from above the freezing point to about 10 degrees Celsius. Symptoms include tingling and numbness; itching, pain, swelling of the legs, feet, or hands; or blisters may develop. In severe cases, gangrene may develop.

Frostnip occurs when the ear lobes, noses, cheeks, fingers, or toes are exposed to the cold and the top layers of skin freeze. The skin of the affected area turns white and it may feel numb. This is an early version of frostbite.

Since the human body loses heat faster when it's in water, avoid thin ice or open water during the winter months. If you, or someone you know falls into cold water, make sure they get into dry clothes, find shelter and call for medical attention.



Staying Warm

In order to survive and stay active in the cold, there are a few things to keep in mind.



Be aware of the weather conditions and the likely changes, and carry extra blankets and clothes in case the weather becomes colder. Extra clothing is important in case your original clothing becomes wet from rain, sweating or falling into water.

Learn to recognize the symptoms for cold injuries and basic treatments, and be aware of who is most at risk like the elderly, very young, previous cold injury sufferers, and persons who have health conditions.

To maintain body heat you should stay active when out in the cold, eat plenty of food and drink plenty of fluids. Heat retention and tolerance to cold also depends on the size and shape of the body, your body fat percentage, your blood flow and circulation and how you are insulated.



Insulation means the layering of and type of clothes you wear. When working or playing outdoors, choose clothes that suit the temperature, weather conditions, and the level and length of activity. Protective clothing is needed for work at or below 4 degrees Celsius. Clothing should be worn in multiple layers which provide better protection than a

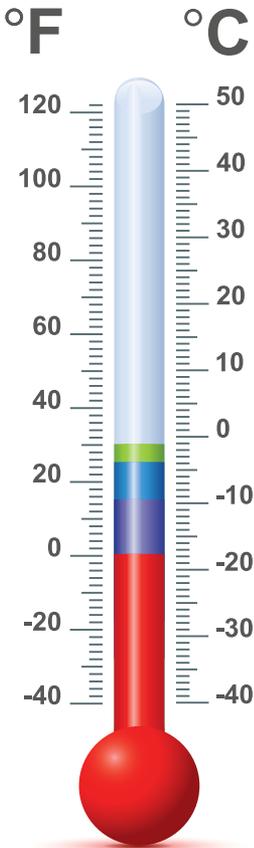
single thick jacket or sweater. The inner layer should provide insulation and be able to keep moisture away from the skin to help keep it dry. Layers should be easy to open or remove before you get too warm to prevent excessive sweating during strenuous activity. For activities in wet conditions, the outer layer of clothing should be waterproof and windproof.



It's extremely important to remember that body heat is lost through the head so wearing a hat will keep you warmer longer.

Don't forget, if you're working outside, or enjoying an activity like skiing or skating, wear face, eye, and/or head protection. Wear mittens or gloves, scarves, appropriate shoes or boots (waterproof and insulated) and layered socks. One thing to avoid is cotton material because it gets damp or wet quickly, and then doesn't keep heat in. Wool and synthetic fibers are two materials that when wet, can still keep the heat in.

Having places to go where people can get warm on breaks (warming huts, shelters, sources of heat available), is necessary, especially if people are working in cold environments.



The National Athletic Trainers' Association position statement provides guidelines to determine at what temperatures we should take extra precautions to avoid cold injuries.

The guidelines state

-1 degrees Celsius and below

Be aware of the potential for cold injury and notify appropriate personnel of the potential.

-4 degrees Celsius and below

Provide additional protective clothing, cover as much exposed skin as practical, and provide opportunities and facilities for rewarming.

-10 degrees Celsius and below

Consider modifying activity to limit exposure or to allow more frequent chances to rewarm.

-18 degrees Celsius and below

Consider terminating or rescheduling activity.

Following this guideline will help protect you and your family during the winter months. If you have no way of keeping yourself warm this winter, contact your local municipality to inquire about emergency shelters during adverse weather conditions.



So get outside,
be active
and have fun!

Resources

Canadian Centre for Occupational Health and Safety. *Cold Environments – General, Working in the Cold, and Health Effects and First Aid*. www.ccohs.ca/oshanswers/phys_agents/

Koutsavlis, Athanasios Tom and Tom Kosatsky. Environmental-Temperature Injury in a Canadian Metropolis. *Journal of Environmental Health*. December 2003. Page 40.

Occupational Health Clinics for Ontario Workers: www.ohcow.on.ca

Environment Canada: Weather Office: www.weather.gc.ca/canada_e.html

Cappaert, Thomas A. et al. National Athletic Trainers' Association Position Statement: Environmental Cold Injuries. *Journal of Athletic Training*. 2008. Pages 640-658.

United States Department of Labor. *Cold Stress and The Cold Stress Equation*. Occupational Safety & Health Administration. www.OSHA.gov

United States Department of Health and Human Services – Centers for Disease Control and Prevention. *Extreme Cold: A Prevention Guide to Promote Your Personal Health and Safety*. www.cdc.gov/niosh/topics/coldstress/



www.novascotia.ca/dhw



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