



Health
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Your health and
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sécurité... notre priorité.

Extreme cold

January 2013

IT'S YOUR HEALTH

Extreme cold

THE ISSUE

Canada has one of the most severe **winter climates** of any country in the world. Canadians across the country may face severe cold weather conditions that can affect their health. However, being active and enjoying winter activities and sports is a great way to stay healthy. Learn how to adjust to cold conditions so you can enjoy the winter weather.



ABOUT EXTREME COLD

Extreme cold is measured differently in different parts of the country. Whenever temperatures drop dramatically below normal, staying warm and safe can become challenging. In general, your risk of health effects like windburn and frostbite increase at **wind chill values** below -27.

The wind can make cold temperatures feel even colder. The **wind chill index** measures what the temperature feels like on exposed skin based on the speed of the wind.

A **wind chill** can cause your body to lose heat faster and your skin to freeze very quickly. Wind chills below -70 have been recorded in some northern Canadian communities.

WHO IS AT RISK?

While anyone who isn't dressed warmly is at risk in cold weather conditions, some are at greater risk than others for frost bite and hypothermia:

- homeless people
- outdoor workers
- people living in homes that are poorly insulated (with no heat or no power)
- people with certain medical conditions such as diabetes, peripheral neuropathy, and diseases affecting the blood vessels
- people taking certain medications including beta-blockers
- winter sport enthusiasts
- infants (under 1 year)
- seniors (65 years or older)

Health risks of extreme cold

A normal body temperature is approximately 37°C (99°F). When your core body temperature drops by 1 or 2°C (1.8 or 3.6°F), or your body is exposed to severe cold it increases your risk of harmful effects.

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What is Windburn

Windburn occurs when cold wind removes the top layer of oil from the skin causing:

- excessive dryness
- redness
- soreness
- itchiness

Although windburn is different than [sunburn](#), people often confuse the two because the symptoms are similar.

What is Frostbite

When the temperature drops below 0°C (32°F), blood vessels close to the skin constrict to protect the core body temperature. When your body is exposed to the cold for a long period of time, blood flow to your hands, feet, nose, and ears can be severely restricted. The combination of poor circulation and extreme cold can lead to frostbite.

[Frostbite](#) generally occurs in body parts furthest from the heart:

- hands
- feet
- nose
- ears

Mild frostbite (frostnip) makes your skin look yellowish or white but it is still soft to the touch. Your skin might turn red during the warming process, but normal colour returns once the area is warmed.

Severe frostbite can cause permanent damage to body tissue if it is not treated immediately. Nerve damage occurs and frostbitten skin becomes discoloured and turns black. After some time, nerve damage becomes so severe that you will lose feeling in the affected area and blisters will occur. If the skin is broken and becomes infected, gangrene can set in which can result in loss of limbs.

What is Hypothermia

There are three stages of hypothermia:

- **Stage 1** - When your body temperature drops by 1 or 2°C (1.8 or 3.6°F), you start shivering, get goose bumps on your skin, and your hands become numb. Your breath can become quick and shallow, and you may feel tired and/or sick to your stomach. You may also experience a warm sensation, which means your body is entering stage 2 of hypothermia.



Here's an easy test to check if you have stage 2 hypothermia:

Try touching your thumb to your little finger. If you can't, your muscles are not working properly and you're experiencing stage 2 hypothermia.

- **Stage 2** - Your body temperature has dropped by 2 - 4°C (3.8 - 7.6°F) and your shivering is strong. Muscles are uncoordinated and movements are slow and laboured. You may suffer mild confusion, become pale, and your lips, ears, fingers, and toes may turn blue.
- **Stage 3** - If your body temperature drops below 32°C (89.6°F), the shivering will stop but you'll have trouble speaking, thinking, and walking. You may even develop amnesia. When your body temperature drops below 30°C

(86.0°F), exposed skin becomes blue and puffy, it will be hard to move your muscles and your behaviour becomes irrational. Your heart may be beating quickly but your pulse and breathing will decrease. At this stage you are at risk of dying.

TREATMENTS FOR EXTREME COLD CONDITIONS

Windburn

Do not scratch or rub the affected area—it can damage the skin.

- Apply a protective skin care product (e.g. therapeutic moisturizers) to the affected area(s) as needed to help relieve the [symptoms of windburn](#).
- Use a protective lip balm to treat lips.

Frostbite

Mild frostbite (frostnip) can be treated in two ways:

- **Passive warming** - move to a warm room, wrap yourself in blankets or reheat your body by skin-to-skin contact with another person.
- **Active warming** - this can be done along with passive warming. Add heat directly to the frostbitten area. The idea is to thaw the injured skin as quickly as possible without burning yourself. Thawing frostbitten skin is very painful so the injured skin should be placed in water that is just above body temperature. Do not rub, massage or shake the injured skin because that can cause more damage.

Severe frostbite requires immediate medical attention. While you are waiting for help to arrive begin treating it with passive and active warming.

Hypothermia

Severe cases of hypothermia (such as stages 2 and 3) require immediate



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medical attention. Call 9-1-1 or your local emergency number.

The following treatment options should be followed for [stage 1 hypothermia](#), or while waiting for help to arrive for more severe hypothermia:

- find shelter
- keep your muscles moving
- dry and (gradually) warm your body
- wrap yourself in blankets/dry clothing or reheat your body by skin-to-skin contact with another person
- drink warm, sweet liquids
- don't fight shivering, this is one of the ways your body increases its core temperature
- if the person is unconscious lay them down and avoid shaking them or handling them roughly as they may have an arrhythmia (irregular heart beat)

REDUCE YOUR RISK

Protect yourself from extreme cold conditions by following these tips:

Wear appropriate clothing

- Always wear clothing appropriate for the weather. Synthetic and wool fabrics provide better insulation. Some synthetic fabrics are designed to keep perspiration away from your body which keep you dry and further reduce your risk.

- Dress in layers with a wind resistant outer layer. You can remove layers if you get too warm (before you start sweating) or add a layer if you get cold.
- Wear warm socks, gloves, a hat and scarf in cold weather. Be sure to put a scarf over your nose to protect it. If you get wet, change into dry clothing as soon as possible. You lose heat faster when you're wet.

Protect yourself

- On sunny days wear sun glasses, lip balm and sunscreen to protect your skin



from UV rays and keep it moisturized to help prevent windburn.

- Wear a face mask and goggles if you are participating in winter activities such as skiing, snowmobiling and skating to protect your face from frostbite and windburn.
- Keep moving (especially your hands and feet) to keep your blood flowing and maintain your body heat.

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Know the weather conditions

- Pay attention to weather alerts in your area. Special weather statements and warnings are issued when extreme weather is possible in your area.
- Environment Canada issues wind chill alerts to warn you of conditions that will cause frostbite to exposed skin.

Find shelter and keep moving

- If you are caught in a severe snowstorm, or outside in extreme cold conditions, look for shelter. If there are no buildings around, a small cave, ditch, hollow tree or a vehicle can help reduce your chances of frostbite or hypothermia. Even if you find shelter, keep moving to maintain your body heat.

Winterize your home

- Prepare your home for cold winter temperatures by doing regular maintenance. Make sure your heating system is working efficiently and seal all cracks and drafts to [keep the heat in](#).

Avoid alcohol

- Consuming alcohol before you go out in the cold may increase your risk of hypothermia because it increases blood flow to the extremities of the body. You may actually feel warm even though you are losing heat.

Know your health risks

- Talk to your health care professional to see if you are at an increased risk from extreme cold due to a medical condition.
- If you have health problems such as a heart condition you may wish to avoid strenuous activities like shovelling snow.



REDUCE YOUR RISK

[Health Canada](#) and the [Public Health Agency of Canada](#) are committed to maintaining and improving the health of Canadians. They are working with their partners to better understand the impacts of extreme cold on the health of Canadians, particularly those at greatest risk, and to promote efforts to reduce these risks.

[Environment Canada's Meteorological Service](#) gives Canadians as much advance notice as possible about potentially hazardous weather and provides tips on how to report and prepare for it. By issuing warnings, watches, and special statements, the [Public Alerting Program](#) helps people take steps to protect themselves and their property from harm. In addition to public alerts, Environment Canada issues special mariner alerts to warn mariners when hazardous marine weather, ice conditions or icebergs could threaten their safety.

FOR MORE INFORMATION

For more information on winter weather and what you can do to protect yourself from extreme cold, visit the following websites:

- Environment Canada, [Weather website](#) at: www.weatheroffice.gc.ca/canada_e.html

- Environment Canada, [Wind Chill Index](#) at: [www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=46FBA88B-1#Wind Chill](http://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=46FBA88B-1#Wind%20Chill)
- Environment Canada, [Wind chill calculator](#): www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=0F42F92D-1
- Environment Canada, [Winter Weather](#) at: www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=D2F64537-1
- Environment Canada, [Winter Hazards](#) at: www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=46FBA88B-1
- Environment Canada, [Public Weather Warnings](#) at: www.weatheroffice.gc.ca/warnings/warnings_e.html
- Transport Canada, [Winter Driving](#) at: <http://www.tc.gc.ca/eng/roadsafety/safevehicles-safetyfeatures-winterdriving-index-693.htm>
- Natural Resources Canada, [Keeping the Heat In](#) at: www.oeenrcan.gc.ca/publications/residential/8584

For industry and professionals

- Canadian Centre for Occupational Health and Safety, [Exposure limits for working in the cold](#) at: www.ccohs.ca/oshanswers/phys_agents/hot_cold.html#_1_4
- Canadian Centre for Occupational Health and Safety, [Cold Environments](#) at: www.ccohs.ca/oshanswers/phys_agents/cold_general.html

Related resources

- *It's Your Health*, [Preparing for an Emergency](#) at: www.hc-sc.gc.ca/hl-vs/iyh-vsv/life-vie/emerg-urg-eng.php
- the Government of Canada, [Climate Change](#) at: www.climatechange.gc.ca/default.asp?lang=En&n=E18C8F2D-1



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- Health Canada, [Climate change and health](http://www.hc-sc.gc.ca/ewh-semt/climat/index-eng.php) at: www.hc-sc.gc.ca/ewh-semt/climat/index-eng.php
- Healthy Canadians, [Sun safety](http://www.healthycanadians.gc.ca/environment-environnement/sun-soleil/index-eng.php) at: www.healthycanadians.gc.ca/environment-environnement/sun-soleil/index-eng.php
- For health and safety information you can trust visit the [Healthy Canadians](http://www.healthycanadians.gc.ca) website at: www.healthycanadians.gc.ca
- For more articles on health and safety issues go to the [It's Your Health](http://www.health.gc.ca/iyh) web section at: www.health.gc.ca/iyh

You can also call toll free at
1-866-225-0709 TTY at 1-800-267-1245*.

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