

School Health – Severe Weather #2

Severe Cold Weather

Weather and the natural environment can be a child’s best friend – or her worst enemy. Outdoor play is an important and integral part of childrens’ development. Monitoring inclement and severe weather and making decisions affecting the school day can be a delicate balancing act between health and safety and giving kids “room to grow”. The goal of this series of fact sheets is to provide some parameters and guidelines to assist school administrators and others in making decisions related to severe weather.

Cold Weather

For Canadian students, severe cold weather is a fact of life. Dressing appropriately, and in layers, is the best way of being prepared for severe cold weather. Winter coats, hats and gloves or mittens should be standard equipment for all school aged children. The chart below will help determine “wind chill” hazards. The wind chill is a measure of the temperature that factors in the wind speed and gives an equivalent of what the combined effect of temperature and wind “feels like”.

Wind Chill Calculation Chart

T air (°C)	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
V ₁₀ (km/h)												
5	4	-2	-7	-13	-19	-24	-30	-36	-41	-47	-53	-58
10	3	-3	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63
15	2	-4	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66
20	1	-5	-12	-18	-24	-31	-37	-43	-49	-56	-62	-68
25	1	-6	-12	-19	-25	-32	-38	-45	-51	-57	-64	-70
30	0	-7	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72
35	0	-7	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73
40	-1	-7	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74
45	-1	-8	-15	-21	-28	-35	-42	-48	-55	-62	-69	-75
50	-1	-8	-15	-22	-29	-36	-42	-49	-56	-63	-70	-76
55	-2	-9	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77
60	-2	-9	-16	-23	-30	-37	-43	-50	-57	-64	-71	-78
65	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79
70	-2	-9	-16	-23	-30	-37	-44	-51	-59	-66	-73	-80
75	-3	-10	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80
80	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81

where T_{air} = Actual air temperature in °C

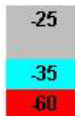
V₁₀ = Wind speed at 10 metres in km/h (as reported in weather observations)

Approximate Thresholds:

Risk of frostbite in prolonged exposure: windchill below

Frostbite possible in 10 minutes at

Frostbite possible in less than 2 minutes at



Guidelines

Principals should consider limiting outdoor time to 30 minutes or less when the windchill is at or below -25°.

When windchill is at or below -35°, outdoor activities should be cancelled.



Community Health Services Department

Your partners in good health!

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Cold Injuries

Exposure to the cold can be hazardous, or even life-threatening. Your body's extremities, such as the ears, nose, fingers and toes, lose heat the fastest. Exposed skin may freeze, causing frostnip or frostbite. In extreme conditions or after prolonged exposure to the cold, the body core can also lose heat, resulting in hypothermia.

Frostnip

- a mild form of frostbite, where only the skin freezes
- skin appears yellowish or white, but feels soft to the touch
- painful tingling or burning sensation

What to do:

- do not rub or massage the area
- warm the area gradually -- use body heat (a warm hand), or warm water, avoid direct heat which can burn the skin
- once the affected area is warm, do not re-expose it to the cold

Frostbite

- a more severe condition, where both the skin and the underlying tissue (fat, muscle, bone) are frozen
- skin appears white and waxy, and is hard to the touch
- no sensation -- the area is numb

What to do:

- frostbite can be serious, and can result in amputation. Get medical help.

- do not rub or massage the area
- do not warm the area until you can ensure it will stay warm
- warm the area gradually -- use body heat, or warm water (40 to 42°C), avoid direct heat which can burn the skin

Hypothermia

- feeling cold over a prolonged period of time can cause a drop in body temperature (below the normal 37°C)
- shivering, confusion and loss of muscular control can occur
- can progress to a life-threatening condition where shivering stops, the person loses consciousness, and cardiac arrest may occur

What to do:

- get medical attention immediately
- lay the person down and avoid rough handling, particularly if the person is unconscious
- get the person indoors
- gently remove wet clothing
- warm the person gradually, using any available source of heat



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Avoiding Cold Injury

1. Listen to the weather forecast

- check the Environment Canada weather forecast before going out in the cold
- if conditions are hazardous, a wind chill warning will be issued
- if the wind chill is very cold, exposed skin can freeze in minutes

2. Plan Ahead

- Groups and organizations should develop a plan in advance, to ensure that safety concerns are addressed when the wind chill is high. For example, schools could hold recess indoors, outside workers could schedule warm-up breaks, and those involved in winter recreation could reduce the amount of time they spend outdoors.

3. Dress warmly

- wear layers of warm clothing, with an outer jacket that is wind-resistant. Mittens, boots and a hat are also important. (We lose a large portion of our body heat from the head.)
- when the wind chill is high, try to cover as much exposed skin as possible.
- wear a scarf, neck tube or face mask.
- check frequently for signs of frostbite

4. Seek shelter

- get out of the wind

- when wind chill is very cold, limit the time you spend outside

5. Stay dry

- wet clothing chills the body rapidly
- remove outer layers of clothing or open your coat if you are sweating

6. Keep Active

- walking or running will help keep you warm by generating body heat

7. Know your limits

- some people are more susceptible to the cold, particularly children, the elderly and those with circulation problems
- the use of alcohol, tobacco and certain medications will increase your susceptibility to cold

Web Links

These internet links will help provide accurate weather and environmental conditions.

www.msc.ec.gc.ca/windchill/Windchill_Calculator_e.cfm

Source:

Defence R&D Canada, Defence Research and Development Canada Toronto (DRDC Toronto, formerly the Defence and Civil Institute of Environmental Medicine) -- the research agency of the Canadian Department of National Defence.

Canadian Pediatric Society, www.caringforkids.cps.ca