

Cold stress and outdoor workers: Safety considerations for your patients

Canada has a severe winter climate, and the cold weather presents risks to your patients who work outdoors. According to the Canadian Centre for Occupational Health and Safety, many occupations particularly at risk of cold-exposure injuries are in the construction, utility, and transport industries, and in emergency response.¹ Discussing the health risks of cold stress with at-risk patients and providing guidance may help prevent cold-exposure injuries.

Health risks of cold stress and overview of management

Cold environments can affect people in three ways: through temperature, wind

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speed, and humidity. Alone or in combination, these can cause cold-stress injuries such as frostbite and hypothermia. Below is a summary of key management points for these conditions. For a comprehensive review, please see the references.²⁻⁴

In cases of frostbite, the skin and underlying tissues, including fat, muscle, and bone, can be frozen, and auto-amputation can occur. Skin may appear waxy and may be hard to the touch, and the affected area may be numb. It is imperative to avoid direct heat and not rub or massage the affected area. Body heat or warm water (40–42 °C) can be used to gradually warm the affected area, but only if refreezing can be avoided.²⁻⁴

Hypothermia is the most serious and life-threatening cold injury and is due to a sustained core temperature below 35 °C. Symptoms include shivering, difficulty walking and talking, and confusion, and

can progress to loss of consciousness and cardiac arrest. Immediate medical assistance is required, and the patient must be moved indoors. Any wet clothing should be removed, and the patient should be rewarmed cautiously.^{2,3}

WorkSafeBC guidance

WorkSafeBC's OHS Guidelines include guidelines for cold exposure. The Table is based on one such guideline and is an example of how the risk of cold-exposure injuries can be reduced.⁵

Factoring in windchill

Windchill is the combination of cold air plus wind speed and is the felt temperature on exposed skin. Generally, as wind speed increases, felt temperature decreases. The risk of health effects like frostbite typically increases at windchill values below -27 °C.⁶

Continued on page 351

TABLE. Work/warm-up schedule for workers conducting moderate to heavy work activity.

Air temperature (°C), sunny sky	No noticeable wind		8 km/h wind		16 km/h wind		25 km/h wind		30 km/h wind	
	Max. work period	No. of breaks	Max. work period	No. of breaks	Max. work period	No. of breaks	Max. work period	No. of breaks	Max. work period	No. of breaks
-26 to -28	Normal	1	Normal	1	75 minutes	2	55 minutes	3	40 minutes	4
-29 to -31	Normal	1	75 minutes	2	55 minutes	3	40 minutes	4	30 minutes*	5
-32 to -34	75 minutes	2	55 minutes	3	40 minutes	4	30 minutes*	5	Non-emergency work should cease.	
-35 to -37	55 minutes	3	40 minutes	4	30 minutes*	5	Non-emergency work should cease.			
-38 to -39	40 minutes	4	30 minutes*	5	Non-emergency work should cease.					
-40 to -42	30 minutes*	5	Non-emergency work should cease.							
-43 and below	Non-emergency work should cease.									

* There is a danger that exposed skin may freeze; appropriate covering precautions must be taken.

The schedule is for a 4-hour shift and assumes workers are wearing dry clothing. Each break should be 10 minutes long and taken in a warm location, and a 40-minute break should be taken in a warm location after the shift ends.

Continued from page 350

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Continued from page 349

Environment and Climate Change Canada provides guidance on how to estimate and respond to windchill values.⁷ Your patients who work outdoors may find this guidance useful.

To learn more

For more information, consult www.worksafebc.com/en/health-safety/hazards-exposures/cold-stress.

To speak with a WorkSafeBC medical advisor about a patient with a work-related illness or injury, submit a RACE request (www.raceconnect.ca). If you or your patients have workplace safety questions, call the Prevention Information Line at 1 888 621-7233. ■

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