

Cold Weather Tips

Winter provides a variety of cold weather challenges as temperatures plunge and winds pick-up. It is no wonder that crime is down during periods of extreme cold. Protecting your crews from the elements as they work outdoors is a matter of understanding the risk and knowing how to address it.

The Risk

Two risks that your employees face when working in cold weather are **frostbite** and **hypothermia**. Understanding how they occur is part of the strategy of understanding how to deal with them.

Frostbite occurs when the blood cells constrict in order to send more (warming) blood to the vital organs at the core of the body. This natural process occurs to prevent hypothermia. However, this process prevents the extremities – hands, feet, nose, cheeks or ears - from receiving enough blood to warm them. When the surface skin temperature drops low enough, ice crystals form between and in the cells, freezing the tissue and possibly rupturing the cells.¹ An above freezing temperature, coupled with a strong wind, can combine to provide a lower than freezing affect on the skin to cause frostbite – especially if your worker is wet or working at high altitude.²

Hypothermia occurs when the body temperature falls below 93-95 degrees F. It occurs not only during bitter cold. Hypothermia can occur when other factors exist, such as moisture, higher wind speeds, when alcohol or drugs are consumed, and of course hypothermia risk increases depending on the duration of the cold. An example of hypothermia occurring happened when the earlier daytime temperature was 55 degrees, followed by a rain and a drop in temperature to 34 degrees. The patient, having been outdoors all day, developed hypothermia and required hospital treatment to recover.

Heat leaves the skin and lungs in several ways – it *radiates* away – an uncovered head, for example; it *conducts* away – it transfers to wet clothing, for example; it can leave through *convection* by having wind move across the surface skin; and it can *evaporate* through sweating and perspiration. When hypothermia occurs, the body undergoes a series of critical cellular and chemical imbalances. The water in your cells crystallizes and the cells begin to die.

New Wind Chill Chart
Wind (mph)

Calms	5	10	15	20	25	30	35	40	45	50	55	60
40	36	34	32	30	29	28	28	27	26	26	25	25
35	31	27	25	24	23	22	21	20	19	19	18	17
30	25	21	19	17	16	15	14	13	12	12	11	10
25	19	15	13	11	9	8	7	6	5	4	4	3
20	13	9	6	4	3	1	0	-1	-2	-3	-3	-4
15	7	3	0	-2	-4	-5	-7	-8	-9	-10	-11	-11
10	1	-4	-7	-9	-11	-12	-14	-15	-16	-17	-18	-19
5	-5	-10	-13	-15	-17	-19	-21	-22	-23	-24	-25	-26
0	-11	-16	-19	-22	-24	-26	-27	-29	-30	-31	-32	-33
-5	-16	-22	-26	-29	-31	-33	-34	-36	-37	-38	-39	-40
-10	-22	-28	-32	-35	-37	-39	-41	-43	-44	-45	-46	-48
-15	-28	-35	-39	-42	-44	-46	-48	-50	-51	-52	-54	-55
-20	-34	-41	-45	-48	-51	-53	-55	-57	-58	-60	-61	-62
-25	-40	-47	-51	-55	-58	-60	-62	-64	-65	-67	-68	-69
-30	-46	-53	-58	-61	-64	-67	-69	-71	-72	-74	-75	-76
-35	-52	-59	-64	-68	-71	-73	-76	-78	-79	-81	-82	-84
-40	-57	-66	-71	-74	-78	-80	-82	-84	-86	-88	-89	-91
-45	-63	-72	-77	-81	-84	-87	-89	-91	-93	-95	-97	-98

Frostbite Times

■	30 Minutes	■	10 Minutes	■	5 Minutes
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¹ The Mayo Clinic – First Aid for Hypothermia; and The University of Maryland Medical Center, Center for Integrative Medicine – Understanding Frostbite

² New Wind Chill Chart courtesy of the University of North Texas and the National Oceanic and Atmospheric Administration.

So there we have it ... winter weather and the need to work outdoors exposes our employees to the risk of frostbite and/or hypothermia. A combination of winter environmental conditions and worker behaviors increases the risk.

Environment	Behaviors
Time of year	Inadequate or wet clothing
Ambient Temperature	Immersion
Wind Chill	Prolonged exposure
Water Chill	Lack of fitness; or fatigue

The Risk Mitigation

So knowing what you now do about frostbite and hypothermia, how can you protect your workers from the *risk*? Well, it seems that **“mom knew best.”**

“Wear a sweater under your jacket”
Wear several layers of warm clothing that allow you to move while providing protection from wind and water.
“Wear a bigger coat”
Outer garments should be tightly woven and water repellent to reduce body- heat loss caused by the wind.
“Dress warmly and cover your ears”
Wear a hat, mittens/gloves and sturdy waterproof boots. Cover your mouth with a scarf to protect your lungs. Cover your ears and cheeks. If exposed for long periods, wear a cloth face covering to protect your nose.
“Don’t play too hard”
Avoid exhaustion or fatigue because energy is needed to keep muscles warm. Be sure workers in extreme conditions take a frequent short break in warm dry shelters to allow their bodies to warm up.
“Have honey with lemon”
Drink warm, sweet beverages (sugar water, sports-type drinks) and avoid drinks with caffeine (coffee, tea, sodas or hot chocolate) or alcohol.
“Don’t go out alone”
Use the buddy system-work in pairs so that one worker can recognize danger signs for the other. Train your workers to recognize the signs in themselves and their fellow workers.

And another thing ... Watch for the development of white patches on the face and ears of your workers and companions. These may signal frostbite.

If you think you have frostbite, *never* massage or vigorously rub the affected area. The best thing to do is to re-warm the affected area. You can do that by applying warm water (101-104 degrees) in a safe and warm area. Repeatedly apply warm clothes to the affected area. Do not use hot water, heating pads, or fire, because these may burn the skin before the feeling returns.³

Make sure your workers know the signs and dangers of exposure to wind and cold. It will give them a *warm* feeling about you.

³ Frostbite is a medical emergency and it's important to get conventional medical care as soon as possible. This article is not to be substituted for obtaining professional medical guidance and assistance in an emergency.