



Preventing Cold-Related Illness in Workers

[Cold stress](#) happens when the environment is cold enough to lower a worker's skin and core body temperature. If proper steps aren't taken, the body may struggle to warm itself and drop below 95°F, leading to cold-related illnesses like **frostbite or hypothermia**. Cold temperatures, combined with **wind and dampness**, can worsen these conditions.

EXTREME COLD HEALTH IMPACTS

Early recognition of cold stress symptoms is crucial to prevent serious health issues. Workers and managers in cold weather operations should receive proper training to identify hypothermia and frostbite, ensuring they can protect their colleagues and employees effectively.

Hypothermia occurs when the body temperature drops below 95°F. Initial symptoms might include:

- Uncontrollable shivering
- Feeling very cold
- Irregular heartbeat
- Weak pulse
- Changes in blood pressure

If left untreated, these symptoms might progress to include:

- Severe shaking
- Slow or slurred speech
- Confusion
- Drowsiness

The final symptoms before complete collapse include:

- Cold skin
- Slow breathing
- Low blood pressure
- Extreme fatigue unrelieved by resting

If someone shows signs of hypothermia, it's important to act quickly to remove them from the dangerous conditions and to help them recover. **The following actions are recommended:**

- Move them to a warm, dry place.
- Replace wet clothes with dry ones.
- Cover them with blankets.
- Offer a non-alcoholic, sweet, hot drink.
- Place heat warmers under their armpits, by their chest sides, and near the groin.
- Seek medical help promptly

Frostbite happens when body parts like fingers, toes, face, and ears don't get enough warmth due to poor circulation or insulation. Symptoms of frostbite in an exposed area of skin can include the following:

- Numbness
- Skin blistering
- The affected area feeling hard to touch



In severe cases, frostbite can lead to tissue loss or the need for amputation of the affected area. If someone shows signs of frostbite, **the following actions are recommended:**

- Move them to warmth.
- Loosely cover and protect the affected area.
- Don't attempt to rewarm the affected area yourself, as this can cause more damage.
- Seek medical help and wait for treatment.

MONITORING FOR EXTREME COLD CONDITIONS

The wind chill chart created by the National Weather Service can be used to plan for cold weather and wind. It estimates how cold it feels due to a combination of **air temperature and wind speed**. This can feel colder than just the air temperature itself. Even relatively mild air temperatures can cause frostbite if there's a low wind chill. At low wind chills, exposed skin can become frostbitten very quickly.

Wind Speed (mph)	Air Temperature (°F)														
	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35
Calm	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35
5	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52
10	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59
15	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64
20	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68
25	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71
30	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73
35	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76
40	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78
45	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79
50	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81
55	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82
60	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84

Risk of Hypothermia or Frostbite	Low Risk	Moderate Risk <i>Exposed skin can freeze in 30 minutes.</i>	High Risk <i>Exposed skin can freeze in 10 minutes.</i>	Very High Risk <i>Exposed skin can freeze in 5 minutes or less</i>
----------------------------------	----------	----------------------------------------------------------------	------------------------------------------------------------	-----------------------------------------------------------------------

FIGURE 1: NATIONAL WEATHER SERVICE (NWS) WIND CHILL DEFINITION AND EXPOSURE RISKS

RECOMMENDATIONS FOR EMPLOYERS

- Recognize that cold environments can induce **cold stress** by reducing skin and core body temperatures in workers.
- The **wind chill** should be used to identify days with high cold stress risk and a cold stress policy should be implemented to plan for cold weather.
- **Layer clothing** when working outdoors and **be aware of maximum exposure limits** at different wind chills when scheduling work.
- Recognize the symptoms of hypothermia and frostbite: uncontrollable shivering, irregular heartbeat, weakened pulse, and numbness or hardness in extremities. **Seek immediate medical treatment** to prevent coma, death, or amputation.

CONTACT US

If you have any questions or concerns about protecting workers from cold related illnesses, please contact the Division of Environmental Health Epidemiology at the PA DOH by calling 717-787-3350 or emailing us at dehe@pa.gov.