



Avoiding Frostbite

Golf course maintenance employees frequently work outside for extended periods of time during cold-weather conditions and run the risk of receiving cold injuries due to exposure. The severity of cold injuries depends on the temperature, wind-chill factor, duration of exposure and how well-prepared you are to deal with frigid weather. Last winter, I obtained some information and facts on this topic from an article written by Dr. Isadore Rosenfeld for Parade Magazine and wish to pass along some excerpts and my comments because of their relevance to our profession.

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Exposed skin and underlying tissues can be damaged when the temperature falls below freezing (32°F, 0°C). Anyone with a circulatory problem is especially vulnerable. However, if there is a stiff breeze, even temperatures above freezing can hurt you. That's because there is a very thin layer of still air that normally envelops the body at rest. When wind blows that coating away, the skin is more exposed to cold air, which now comes into direct contact with it. So you can't go by the temperature alone. Always check for the wind-chill factor. Human flesh exposed will freeze in 30 minutes or less at a temperature or wind-chill factor of -18°F.

When you are out in cold weather, especially if the wind-chill factor is below 32°F, take the following preventive measures (all the more important if you've had frostbite before):

- **Dress in layers.** Layers of loose-fitting garments will insulate your body by trapping warm, dry air. Goose down, loosely woven cotton and wool are better insulators than synthetics. Wear thermal underwear, a close-woven shirt, a lightweight sweater and slacks, insulated coveralls and a down-filled parka to repel both wind and water.
- **Cover your head and neck.** They lose heat faster than any other part of the body. Wear a hat, scarf and turtleneck. Cover your face and ears. I've discovered that a head sock works exceptionally well at protecting the entire head, face and neck area.
- **Protect your hands and feet.** Mittens are better than gloves. Socks should be woolen or insulated. Boots should be insulated, waterproof and high enough to protect the ankles. Now that you are wearing 50 pounds of pro-

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rective clothing and are looking like a native of the Arctic coastal regions of North America, please continue reading.

- **Always have extra winter clothes** in your car and locker during the cold months. You never know when your vehicle may be stalled in frigid weather late at night on a back road with little traffic.
- **Apply a waterproof moisturizer** such as a skin cream to exposed parts of your body (face and ears) before you go outdoors.
- **Never take a hot bath or shower before going outdoors.** It dilates the blood vessels on the surface of the body.
- **Take a cell phone with you.**
- **Load up on carbs and liquids.** For cold-weather activities, getting enough carbohydrates and fluids is the key to cold tolerance.
- **Don't booze** when engaged in outdoor activities in the cold.

If, despite precautions, cold injury occurs, recognizing and treating the condition is vital. Cold injuries come in three stages of severity.

- **Frostnip.** The hands or feet tingle, then hurt and eventually become numb, soft and white. *What to do:* Breathe on the frozen fingers until you can soak them in warm (not hot) water. It usually takes about half an hour for the numbness to disappear. Continue rewarming the limb until the skin has a pink flush. The thawing process may be painful, especially during the last 10 minutes, so take a mild painkiller such as acetaminophen or ibuprofen. Avoid aspirin, as it enhances the action of some of the chemicals that are produced when tissue freezes. Frostnip does not cause permanent damage, and there's usually no need to see a doctor.
- **Superficial frostbite.** The skin is numb and feels waxy. It is also hard—not soft, as in frostnip—because ice crystals have formed in

the surface layers. The limb turns from white to gray or yellow patches. At this stage, the deeper tissues have not yet been damaged.

What to do: If your feet and toes are frozen, don't walk on them, and keep them raised once you're indoors. Apply warm towels to the affected area, or immerse in water no warmer than 105°F (40°C) for an hour or so. As blood flow returns, the skin begins to thaw and becomes red, flaky and painful. Blisters will form the next day. Don't pop them. Cover the area with a clean cloth, and look for evidence of infection (pain, redness, pus or red streaks on the skin), in which event see a doctor. Do not expose frostbitten skin to cold for several days or until it has healed completely.

- **Deep frostbite,** a prime emergency. Read on only if you have a strong stomach, because this gets really ugly, really fast. The continued reduction in blood supply to frozen tissue damages not only the skin, but also the muscles, nerves, tendons and even bones. This can result in permanent injury that can lead to amputation and even death. In this condition, the body temperature drops below 95°F (hypothermia). Tissues are completely numb, hard like wood, waxy and pale. You're likely to feel nauseated, tired and confused. You may shiver uncontrollably, your speech is slurred and your movements are clumsy—all forerunners of possible coma. There's no time for home measures. *What to do (and not do):*
 - Get indoors immediately and arrange to go at once to the nearest emergency room.
 - Remove all your wet clothing and loosen any tight clothes that can cut off blood flow.
 - Never rub the affected area with anything, even your hands. There is a prevalent and dangerous myth that frozen limbs should be rubbed with snow. Big mistake! Don't ever do it.
 - Immerse the frozen area in lukewarm water (no hotter than 105°F) or apply warm towels for 20 minutes. Never use dry heat, such as a heating pad or heat lamp—and don't get too close

Cold injuries come in three stages of severity: frostnip, superficial frostbite and deep frostbite.

to a stove, radiator or fireplace. The injured tissue can't sense the heat, and you could burn yourself.

- Drink hot liquids such as tea or coffee, but avoid alcohol or tobacco no matter how relaxing you think they are. Alcohol dilates the blood vessels on the skin's surface, promoting heat loss. Nicotine constricts the blood vessels, further reducing blood flow to the chilled area.
- Check whatever medications you're taking to be sure they can't affect your circulation and worsen frostbite—for example, beta-blockers such as propranolol or atenolol, or certain tranquilizers.
- A frostbitten limb that thaws often turns blue or purple, and blisters may form. It may swell for a month or longer, but if you act in time, you may be able to avoid gangrene and amputation. However, you won't know the extent of the damage for six weeks or longer.

If you must go out in frigid weather, keep warm and dry. But remember: any frostbite associated with a body temperature lower than 95°F is a prime medical emergency!

