



An Underestimated Risk to Utility Workers

By Alex Marcoux

A look at the photos accompanying this article should alert you to this often unheeded danger. Learn more about frostbite and the predisposing factors that significantly increase its likelihood.

David awkwardly gripped the mug with his right hand, forgetting the deformities, and the ceramic cup fell to the floor and shattered. To this day, simple tasks such as fetching a cup of coffee prove to be tricky. Since the incident, David has been relegated to the meter shop rather than working out in the field. Disappointed with his clumsy act, he recalled the event that claimed two fingers and the job he had thoroughly loved.

It was a bitter day, but David had worked under more frigid conditions. Crouching, he attempted to drill the screw into place, but for the third time it popped back at him. Frustrated, he yanked the oversized glove from his right hand and grabbed the cold metallic tool. Successfully he secured the screw into place. "Eleven to go," he mumbled as he reached for more hardware. A half hour later he sat in his

truck, inspecting his red, freezing fingers. They throbbed. He cranked the heat and placed the hand beneath a vent to warm it. He had only three more sites in the area and knew his superior would not take kindly to quitting because of a little cold. By the time he had arrived at the next site, his hand felt much improved, so he repeated the precarious routine. Aggravating David's problem was that his hand froze, thawed and then refroze. Refreezing causes more damage.

Like David, most utility workers in North America face the threat of frostbite. Nearly all dismiss it as an insignificant risk, until it's too late. This is a problem, as frostbite can result in permanently disabling injuries, including the loss of fingers, toes, noses, hands, feet, arms or legs.

Art Seely, president of Snow Operations Training Center and prominent expert in snow safety, is always amazed at the lack of awareness among utility workers concerning frostbite. According to Seely, there are commonly encountered situations by utility workers that can cause frostbite. The most obvious is working under freezing conditions while being ungloved or wearing inadequate gloves. Also, heat is rapidly drawn from your skin if you're holding a metallic tool or working on or beside a metallic enclosure (a conductive substance). Another frequently encountered incident is spilling extremely cold fluids on your skin, such as gasoline and kerosene, in which case the fluid acts exactly the same as cold metal and drains the skin of heat.

WHO'S SUSCEPTIBLE TO FROSTBITE?

Frostbite is dead skin and tissue cells caused from freezing. Like heat burns, it is ranked by degrees. First degree is comparable to mild sunburn, with redness and some pain. With second degree, the damage extends to the deeper skin layers and blisters form, similar to severe sunburn. Although a full recovery without scarring is possible, the recovery time is longer. The blisters should be protected from tearing to minimize infection. There is scarring in third degree frostbite, possibly the loss of extremities, with a lengthy healing period. In this case, the damage has extended beyond the skin, and can destroy underlying soft tissue, muscle, bone and blood vessels.

According to Seely, there are predisposing factors that significantly increase the likelihood of frostbite. The most influencing factors are: hypothermia, dehydration, circulatory disorders and constricting clothing.

Hypothermia is a dangerous condition where the body's inherent warming mechanisms fail to maintain normal body temperature and the entire body cools. This condition impairs our muscular and cerebral functions. The brain attempts to maintain the body's core temperature by diverting blood away from capillaries in our skin and extremities. Although this protects our body's core against further heat loss, it weakens the surface skin's ability to warm, as well as receive oxygen and nutrients.

Dehydration is simply excessive loss of fluids from the body. To assume that we can reverse dehydration by suddenly drinking large volumes of water isn't good enough. Although this may increase the body's blood circulation, it doesn't replenish the cells and the fluids between the cells—where frostbite targets its damage. The solution to this concern is obvious—stay hydrated at all times.

Any condition that reduces **circulation** to the hands and feet will increase the risk of frostbite. A previous frostbite injury could leave small blood vessels damaged, reducing circulation. Also,

and warm articles. *Never* rub a frostbitten extremity, and once a frostbitten area has been warmed, *do not* refreeze it, as the damage on the second freezing is much more severe than the first.

Frostbite is a real threat and not to be taken lightly. Unfortunately, horror stories like David's occur more than you'd expect. How can you avoid the trap of underestimating the risk of frostbite? Take the threat seriously, assess if you're predisposed, and be prepared for the elements. Should you suffer frostbite—properly treating the condition is imperative. *ip*



Alex Marcoux is a freelance writer in Littleton, Colorado. She can be reached at alex@alexmarcoux.com.



medical conditions such as diabetes, Reynaud's disease, circulatory and cardiac disorders increase the risk. Nicotine causes vasoconstriction (constriction of blood vessels), making a smoker or tobacco chewer more susceptible to frostbite.

Tight fitting clothing can reduce blood flow to an extremity. Examples of poor choices are garments with wrist or ankle bands, snug gloves with stretchable fabric, or wearing extra socks when the footwear doesn't accommodate them. One simple tactic to help prevent frostbitten toes: if your feet are cold, loosen the laces on your boots. It can be that simple.

If you suspect frostbite, it's imperative to remove wet or cold clothing and replace it with loosely fitting, soft, dry,