

Winter survival basics

In 1998 more than 2,000 people in the US died from exposure to winter conditions. Carbon monoxide poisoning caused more than 85% of the deaths; hypothermia caused the others. If you work, play, or travel in winter conditions, you should understand some basics about these hazards and know simple protective measures.

Plow drivers and other highway workers need to look after their own safety and be alert for symptoms in their fellow employees. In addition, plow drivers often encounter stranded motorists and need to perform immediate aid and know when to seek medical help. Local highway maintenance personnel learned about winter survival at recent T.I.C. workshops from Steve Jenkins of the Montana LTAP Center.

Carbon monoxide poisoning

You cannot detect carbon monoxide (CO). The gas is odorless, tasteless, and colorless. When inhaled, it attaches to red blood cells, replacing oxygen. The lack of oxygen causes death. Symptoms of CO exposure are headache, drowsiness, nausea, and confusion.

Vehicle exhaust has high CO levels. When a vehicle is moving the gas disperses into the air, but when it is stopped or parked some CO will likely enter the vehicle. We have all driven by a dead skunk on the road and noticed how quickly the smell enters the vehicle. Carbon monoxide from exhaust enters just as quickly.



"In general, people need to know that if their vehicle is parked and running, there is going to be some CO buildup in the cab," says Jenkins. "Be very careful. There are always leaks even in the safest vehicles, even brand new cars."

Being stranded in a snowstorm may make vehicles even more susceptible to carbon monoxide since snow can clog the exhaust system and prevent normal dispersal of the gas. If you are stopped in a storm and running your vehicle be sure the exhaust system is clear of snow and ice. Open the windows about an inch to let in fresh air. Burning candles, Sterno, or other forms of canned heat in a closed vehicle can also introduce carbon monoxide. Keep fresh air moving to supply oxygen and flush out CO. Be alert for carbon monoxide in any combustion that is inefficient. Watch for smoke; if visible, it probably has significant amounts of carbon monoxide.

Carrying a portable carbon monoxide detector in your vehicle can be a good precaution. It is a small pill which you activate if you become snowbound. It turns black if CO is present and loses color when the gas is removed. It will activate again if the gas returns. It is effective for many days and costs only a few dollars.

Hypothermia

Hypothermia, or lowered body temperature, can be fatal if your heart and other vital organs drop below 86°F. Surprisingly,

most hypothermia fatalities happen when outdoor temperatures are above freezing. Getting wet and being exposed to wind can cause the condition to develop very quickly. Hypothermia severity is divided into five stages from initial symptom (shivering) to a body temperature of 77°F where death is almost certain. (See table.)

"If a person is shivering uncontrollably, then they are probably in first or second stage hypothermia," says Jenkins. "When you find someone who has been exposed to the elements for a long time and see symptoms, and the body is not shivering, that tells you that the body core temperature is below 90 degrees and the person is at third stage hypothermia."

Treating hypothermia in stage one or two is most effective. Simply warming the body core works well. Conscious victims who can swallow should drink warm liquids with a quick energy boost such as hot chocolate or water sweetened with honey or sugar. At first, warm only the chest, back and groin areas, leaving the arms and legs until the core body temperature is restored. People with circulatory problems or older victims need special care. You must warm the body core before the limbs. If limbs warm first, cold blood can rush to the heart and cause a heart attack.

It is much easier to prevent hypothermia than to treat it. Take action when shivering begins. Insulate the body from cold and wind. If clothes are wet, change

Stage	Characteristics	Body Temperature
Initial Symptom	Shivering (may become uncontrollable). Stage of recognition and self-help.	95°F
Second Stage	Sluggish thinking; irrational reasoning, false feeling of warmth. Body cuts circulation, loses muscle control.	95-90°F
Third Stage	Disoriented, stumbling, uncoordinated. Most don't survive alone in the field.	90-86°F
Fourth Stage	Muscle rigidity, unconsciousness and barely detectable signs of life.	86-78°F
Fifth Stage	Death is almost certain. Cardiac arrest.	77°F and below

quickly into dry ones since moisture trapped near the body is the number one enemy. Drink warm fluids loaded with calories; avoid alcohol and caffeine.

"The myth of the St. Bernard dog carrying the flask of brandy remains widespread," says Jenkins. "It's not that alcohol is bad by itself," he says. "But in a winter survival situation, alcohol is not a good thing. It's important to distinguish between watching a Green Bay Packers game and a winter survival situation."

Alcohol dilates pores and increases perspiration rate and circulation making you give off heat rapidly—not the effect you want for hypothermia. It is usually cold or iced and cools the body. Alcohol also puts you in a state of delirium, similar to second stage hypothermia, where you tend to make bad decisions.

Frostbite

Frostbite is another winter hazard. It occurs when body tissues freeze. With light frostbite the skin turns red first, then later turns pale gray or waxy white. In dark-skinned people the waxy white area may be surrounded by a blackish color. To treat light frostbite on the face, cover the area with your hands and warm it until pain returns. On hands, place them uncovered under armpits, on the stomach, or in the crotch. Warm feet next to the skin of a buddy. If frostbite is deep, do not treat it in the field. Do not thaw the area. Transport the victim to a medical facility. Walking on frozen feet can do a lot of damage. The ice crystals act like sharp objects and cut the tissue.

Whether you're working or playing in Wisconsin winter, be aware of the symptoms for CO poisoning, hypothermia, and frostbite. Prevention and early treatment are best. Watch yourself and others and be prepared to act.

"I like the words of Black Elk, a Sioux Chief: *It is in the darkness of their eyes that men lose their way. Not as they suppose in any darkness that shrouds their path,*" says Jenkins. "When it comes to winter survival, those who survive make good decisions. They prepare properly and understand how to survive in the outdoors."

For a copy of the *Winter Survival materials*, contact the T.I.C. See *Resources*, page 6. The *Air-Zone CO detector* is made by Ultra Hardware Products (item No. 7608). It is available for about \$6 on the Web at DoitBest.com (search for "carbon monoxide") or from the manufacturer: Ultra Hardware Products, 800/426-6379.

Calendar

T.I.C. workshops

Specific details and locations are in the announcements sent to all **Crossroads** recipients. For more copies or other information, call the T.I.C. at 800/442-4615. Registration begins after announcements are distributed.

Work Zone Safety

Jan 23	Brookfield	Jan 29	Eau Claire
Jan 24	Brookfield	Jan 30	Cable
Jan 25	Barneveld	Jan 31	Rhineland
Jan 28	Tomah	Feb 1	Green Bay

Highway Safety

Feb 12	Tomah	Feb 18	Green Bay
Feb 13	Eau Claire	Feb 19	Brookfield
Feb 14	Cable	Feb 20	Barneveld
Feb 15	Rhineland		

Road Maintenance

Mar 25	Tomah	Apr 2	Brookfield
Mar 26	Eau Claire	Apr 3	Barneveld
Mar 27	Cable	Apr 4	Green Bay
Mar 28	Rhineland		

Local Transportation Issues (ETN) The T.I.C. and UW Local Government Center present a series on transportation over 103 Wisconsin ETN locations. Fee: \$15/session. Workshops are 10:30 am to 12:20 pm, Thursdays. Call 608/262-9960 for a brochure.

Truck & Heavy Equipment Engines – Jan 17 Experts explain what is new with engines for large public works vehicles. Let future trends in diesel and large gasoline engines help you write specs for future equipment bids.

Local Road Inventory – Mar 14 Learn about early results of the WISLR program. Share experiences and data-use stories with fellow street and road supervisors.

Liability and Legal Issues – Apr 11 Improve your understanding of modern risk management practices and legal obligations relating to road, sidewalk, and bridge maintenance.

Pesticide Applicator Training

Workers applying pesticides along roadsides must be certified or work under a Certified Pesticide Applicator. Two sessions for Right-of-Way Applicators are offered in 2002:

Jan 28 Milwaukee (application deadline Jan 14)

Jan 29 Wausau (application deadline Jan 15)

Note fee changes The fee for first time training and exam is still \$45, but a \$25 fee is now required for each supplemental training session. Pre-registration is mandatory. For details contact the P.A.T. Office at 608/262-7588, e-mail: PAT-program@facstaff.wisc.edu, or on-line at: <http://ipcm.wisc.edu/PAT>. Training videos are also available.

UW-Madison Seminars

Local government officials are eligible for a limited number of scholarships for the following engineering courses. Contact the T.I.C. for details. Courses are in Madison unless otherwise noted.

Effective Bridge Rehabilitation, Dec 3-5

Urban Street Design, Feb 25-27

Minimizing the Impact of Utilities on Streets and Right-of-Ways, Mar 4-5

Improving Public Works Construction Inspection Skills, Mar 18-19

Maintaining Asphalt Pavements, Mar 20-21

Effective Roadway Lighting, Apr 22-24

Traffic Access Design and Control
Apr 24-26, 2002, Milwaukee

Remind drivers of safety around snowplows

Winter snow on roads makes conditions difficult for everybody. Here are some safety reminders you can pass along to the general public:

Maintain your distance to avoid collisions and damage from flying sand and salt.

Move your vehicle to the left side of the lane so the equipment operator can see you in the mirror.

Turn on headlights and windshield wipers for added visibility.

Snow removal equipment may have to slow down, stop, or back up. Beware!

Snowplows usually leave a ridge of snow making passing hazardous. Do not pass until the snowplow reaches a clear area.

Snowplows cause soft snow to swirl, making it difficult to see the plow, and for the plow operator to see you.

Plowing snow on a multi-lane roadway is often done in tandem (more than one snow-

plow at a time). Give them plenty of room. Do not pass on the right side and stay where the operator can see you.

When passing a plow truck, watch out for wing plows that often extend out several feet. Wing plows may be on either side of the truck.

Adapted from an article in the June 2001 issue of *Better Roads*, the newsletter of the Nebraska LTAP center.