

**In this issue of the Environmental Health and Safety (EHS) Listserv, November 29, 2012:**

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## **1. Winter Walking**

Walking around campus or from our vehicle/bus to our workplace during the winter can be hazardous. Every winter slip/trip/fall injuries at UNL attributed to snow and ice account for approximately 3% of the overall number of injuries in a given year. That may not sound like much...until YOU are one of the injured.

Just like winter driving, winter walking requires anticipation. Think "defensive walking." Follow these guidelines to help avoid injury:

- Use footwear appropriate for the surface/conditions. Avoid slick-soled shoes. Wear boots/shoes/overshoes with grip soles such as rubber or neoprene composite.
- Plan ahead to give yourself sufficient time to reach your destination.
- Plan your route and watch where you walk. Avoid routes that have not been cleared or appear glazed over.
- Avoid carrying large/heavy/awkward objects that can obstruct your view or affect your balance or center of gravity.

If you must walk on slippery surfaces:

- Take short steps or shuffle your feet. Walk more slowly so you can react quickly to a change in traction.
- Bend slightly as you walk to keep your center of gravity over your feet. Curl your toes under and walk as "flat-footed" as possible.
- Test potentially slick areas by tapping your foot on them before proceeding.
- Avoid uneven areas and stepping up/down on icy areas such as curbs.
- Keep your hands out of your pockets. Use your arms for balance.

In wintry conditions:

- Use special care in **parking lots**. Try to park in areas free of ice. When entering/exiting your vehicle, use your vehicle for support. Never jump from a vehicle/piece of equipment.
- Think about the **walking surface** whenever you move about campus, especially on days that are sunny. Some area previously cleared may have

partially thawed and refrozen, especially near the edges, leaving a glaze of ice.

- Use caution when **entering a building** as any snow left on your footwear will thaw with the building heat. Notice if the floor is wet from previous entrants. Avoid such indoor wet areas and if they cannot be avoided, traverse them the same as you would walk on ice. Contact Custodial Services to inquire about equipping areas prone to track-in with walk-off mats.
- **Pay complete attention** to your walking. Don't talk on the phone, dig in your purse/briefcase, get distracted by greetings/conversation, think ahead to events of the upcoming day, etc.
- **Follow general guidelines** within the Safe Operating Procedure (SOP), "*Slips, Trips, Falls – Reducing Risk and Avoiding Injury.*"
- Always use "**defensive walking**" techniques. Watch for hazards like black ice.

Resources:

- ***Slips, Trips, Falls – Reducing Risk and Avoiding Injury*** SOP  
[http://ehs.unl.edu/sop/s-slips\\_trips\\_falls.pdf](http://ehs.unl.edu/sop/s-slips_trips_falls.pdf)
- Winter Safety Tips for Walking on Snow and Ice  
<http://www.belvoir.army.mil/safety/doc/Winter%20Safety%20Tips%20for%20Walking%20.pdf>
- Safe Winter Walking <http://www.ehs.iastate.edu/prep/weather/winter/safe-winter-walking>

## 2. Working in the Cold

There are a number of hazards associated with working outside in cold weather. Be aware of potential hazards, their warning signs, and how to avoid the hazard so you can safely navigate this winter season.

- **Hypothermia.** In cold weather your body may lose heat faster than it is produced. Prolonged exposure will eventually use up all your body's stored energy, resulting in an abnormally low body temperature. If low body temperature affects your brain, you may not be able to think clearly or realize you are in trouble. Warning signs include: shivering, fatigue, and loss of coordination.
- **Frostbite.** Frostbite is an injury caused by freezing, characterized by reduced blood flow, leading to lack of feeling and color in the affected body parts. Most often the body parts affected are nose, fingers, toes, ears, cheeks or chin. Warning signs include: numbness, aching, tingling or stinging, bluish or pale skin, and skin that feels unusually firm or waxy.
- **Trench Foot.** Wet feet lose heat 25 times faster than dry feet. To prevent heat loss in such conditions, your body shuts down blood flow to your feet, so the skin dies due to lack of oxygen and nutrients, as well as a build-up of toxic materials.

Warning signs include: skin redness, bleeding under the skin, tingling pain, swelling, blisters or ulcers, and numbness.

- **Chilblains.** Repeatedly exposing skin to cold temperatures can cause permanent damage to groups of small blood vessels in the skin, characterized by redness and itching that return with subsequent exposures. Body parts most often affected are cheeks, ears, fingers and toes. Warning signs include: redness, itching, blistering/ulcers, and inflammation.

Prevention is always the best policy to avoid cold stress. Here are some precautions workers should take if they must work in extreme cold:

- Wear appropriate clothing. Layered clothing, loose and not too tight, provides better insulation yet allows good blood circulation. Wear footwear designed for cold, wet conditions.
- Cover your head to reduce body heat loss. Protect ears, face, hands and feet.
- Try to schedule work for the warmest/driest/least windy part of the day. Take regular breaks in a warm, dry, and protected area. Limit the total amount of time outside during extremely cold weather.
- Do not touch cold metal surfaces with bare skin.
- Stay hydrated by drinking plenty of fluids, especially warm fluids. Avoid drinks with sugar and/or caffeine.
- Avoid exhaustion or fatigue, because energy is necessary to keep muscles warm.
- Be aware if you are taking medications that make you more susceptible to cold stress. Certain medical conditions also increase your risk: diabetes, high blood pressure, or cardiovascular disease.
- Monitor your physical condition and that of your co-workers. You may not be aware of warning signs that a co-worker would be able to observe.

The “**Cold Stress Equation**” chart available from the Occupational Safety and Health Administration (OSHA) will help you evaluate temperature/wind combinations to work outdoors more safely.

Other wintertime hazards, often related to snow cleanup, but also applicable in other outdoor work situations are:

- Lacerations or amputations from improperly attempting to clear jams in snow removal equipment. Make certain all powered equipment is properly guarded, isolated from power sources, and all parts have stopped moving before performing maintenance or attempting to clear a jam. Review the EHS SOP, **Lockout/Tagout for Machines and Equipment** and complete the web-based training of the same name.
- Strains and sprains from prolonged or improper use of shovels or other snow removal equipment. Keep in mind body movement and positioning. Avoid overexertion.
- Carbon monoxide poisoning can result from idling vehicles or use of gasoline or kerosene-powered heaters or generators in an inadequately ventilated

area. Avoid idling vehicles in garages or near buildings where the air-intake may allow exhaust to enter the building. Do not use gasoline/kerosene burning devices indoors without proper ventilation of exhaust fumes. NOTE: Carbon monoxide (CO) is a colorless, odorless, tasteless gas that can cause sudden illness or death. Seek prompt medical attention if you suspect CO poisoning and are feeling dizzy, light-headed, or nauseous.

#### Resources:

- Working Safely In The Cold  
<http://www.nj.gov/health/surv/documents/coldfact.pdf>
- Occupational Safety & Health Administration (OSHA). “*Tips to Protect Workers in Cold Environments.*” [http://www.osha.gov/as/opa/cold\\_weather\\_prep.html](http://www.osha.gov/as/opa/cold_weather_prep.html)
- OSHA. “*Cold Stress Card-The Cold Stress Equation.*”  
<http://www.osha.gov/Publications/osha3156.pdf>
- Centers for Disease Control (CDC) & Prevention. “*Cold Stress.*”  
<http://www.cdc.gov/niosh/topics/coldstress/>
- CDC “*Extreme Cold: A Prevention Guide to Promote Your Personal Health And Safety*” [http://www.bt.cdc.gov/disasters/winter/pdf/cold\\_guide.pdf](http://www.bt.cdc.gov/disasters/winter/pdf/cold_guide.pdf)
- Centers for Disease Control – Carbon Monoxide  
<http://www.cdc.gov/co/fags.htm>
- **Lockout/Tagout for Machines and Equipment** web-based training  
<http://ehs.unl.edu/onlinetraining/>
- Safe Operating Procedures:
  - **Lockout/Tagout for Machines & Equipment: Program Overview**  
[http://ehs.unl.edu/sop/s-loto\\_program\\_overview.pdf](http://ehs.unl.edu/sop/s-loto_program_overview.pdf)
  - **Lockout/Tagout for Machines & Equipment: Special Circumstances**  
[http://ehs.unl.edu/sop/s-loto\\_special\\_circumstances.pdf](http://ehs.unl.edu/sop/s-loto_special_circumstances.pdf)
  - **Lockout/Tagout for Machines & Equipment: Training and Inspections** [http://ehs.unl.edu/sop/s-loto\\_training\\_and\\_inspections.pdf](http://ehs.unl.edu/sop/s-loto_training_and_inspections.pdf)
  - **Lockout/Tagout for Machines & Equipment: Written Procedures**  
[http://ehs.unl.edu/sop/s-loto\\_written\\_procedures.pdf](http://ehs.unl.edu/sop/s-loto_written_procedures.pdf)

### 3. Elements of Creating Safety Cultures in Academic Institutions: Leadership and Management

As you may recall from previous issues of the EHS listserv, there has been a great deal of national attention given to the topic of laboratory safety in higher education following investigations of serious incidents at UCLA and Texas Tech. As a result, the American Chemical Society (ACS) recently issued a report, **Creating Safety Cultures in Academic Institutions**. While this report is focused on laboratory safety, its content is applicable to all campus settings. This report contained seventeen specific recommendations for creating vibrant, strong safety cultures in academic institutions. Each of these recommendations will be highlighted individually and presented as a series in the EHS listserv.

The first recommendation in the ACS report is: Establish the lines of authority for safety; develop a safety policy that includes laboratory safety, and includes safety responsibilities in the job descriptions and performance plans of all employees. The ACS report describes the basis of this recommendation as follows:

The safety culture of an institution plays a critical role in setting the tone for the importance placed upon safety by its members. Leaders are the key to building a strong culture of safety. Leaders inspire others to value safety, seek open and transparent communications to build trust, lead by example, accept responsibility for safety, and hold others accountable for safety. The direction for and strength of the safety culture is determined by its leaders. In the academic arena the lines of authority should be clearly flowing from the president and provost to college deans, to department chairs, to faculty and principal investigators, and staff. Safety is an educational responsibility.

The department chair, senior-tenured faculty, research directors, laboratory supervisors, and principal investigators should set the tone for the safety culture in their departments. They are responsible and accountable for the safety of the faculty, staff, students, and postdoctoral scholars, and for ensuring the following:

- Students are educated in the principles of safety throughout the curriculum;
- Students continuously learn about safety during structured laboratory sessions;
- Students are taught the necessary safety skills to work independently in laboratories;
- Students, who work in research laboratories, are educated and trained in the safety skills they need to conduct research operations safely;
- Faculty, staff, and postdoctoral scholars, who teach or oversee research in laboratories, are educated and trained in safety skills; and
- Early-career faculty members are also mentored in safety and in learning how to develop a safety culture within a research group.

Every member of the campus community is encouraged to adopt the “Safety Ethic” articulated in the ACS report: “value safety, work safely, prevent at-risk behavior, promote safety, and accept responsibility for safety.” Be a proponent of safety and initiate open dialogue within your department on the topic of safety. Consider the culture in your department and the benefit of implementing one or more of the ACS recommended actions for establishing leadership and management for safety. Consider what colleagues at other institutions are doing within their departments and how those actions may be beneficial to UNL.

Resources:

- NU Board of Regents Policy 6.3.5 – General Policy for University Injury and Illness Prevention Program <http://nebraska.edu/docs/board/RegentPolicies.pdf>
- Creating Safety Cultures in Academic Institutions [http://portal.acs.org/portal/PublicWebSite/about/governance/committees/chemicalsafety/CNBP\\_029720](http://portal.acs.org/portal/PublicWebSite/about/governance/committees/chemicalsafety/CNBP_029720)
- ACS *Committee on Chemical Safety* resources <http://www.acs.org/safety>
- **Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards, Revised 2011 Edition** [http://www.nap.edu/catalog.php?record\\_id=12654](http://www.nap.edu/catalog.php?record_id=12654)
- UC (University of California) Center for Laboratory Safety (Resources) <http://cls.ucla.edu/>

#### 4. DOW Chemical Teams Up with Universities on Laboratory Safety

In 2010, colleges, professional schools, and universities had 2.2 injuries per 100 workers, while Dow Chemical reported a mere fraction of that number (0.33 injuries per 100 workers). To help remedy the apparent disparity in safety between industry and academia, Dow Chemical has developed pilot safety collaboration with chemistry, chemical engineering, and materials science departments at three universities: the University of Minnesota, Pennsylvania State University, and the University of California, Santa Barbara. The goal of this partnership is to improve the laboratory safety culture and performance at participating institutions.

In this model, Dow representatives toured laboratories at the participating universities, and made note of deficiencies. They held tours of Dow facilities and seminars for teams from each school. The Dow representatives then met with focus groups of students, postdocs, faculty, and safety staff to understand the campus safety culture. Then each university formed a safety team composed principally of students and postdocs from the different departments involved. Teams set priorities and developed plans to improve laboratory safety culture at their academic institution.

This type of collaborative opportunity and an ever-increasing list of available resources assist all leadership levels at the university to evaluate safety culture and address improvement.

Resources:

- ***Dow Chemical Teams Up With Universities On Laboratory Safety*** <http://cen.acs.org/articles/90/i44/Dow-Chemical-Teams-Universities-Laboratory.html>

## 5. OSHA's Hazard Communication and Laboratory Standards

Regardless of the source, written plans and procedures are understood as foundational to any effective safety program. Hence, the United States Occupational Safety and Health Administration's (OSHA's) **Occupational Exposures to Chemicals in Laboratories Standard** requires the development and implementation of a written "**Chemical Hygiene Plan**" in each laboratory. Similarly, OSHA's **Hazard Communication Standard** requires the development and implementation of a written "**Hazard Communication Plan**" for non-laboratory work areas.

The EHS web-based Virtual Manual serves as a basic written Chemical Hygiene or Hazard Communication Plan for a specific work group or area. If a supervisor/PI opts not to use the Virtual Manual tool, they are responsible for developing an adequate written Hazard Communication/Chemical Hygiene Plan.

If you haven't created a Virtual Manual yet, now is a good time. The Virtual Manual is a web-based tool that assembles pertinent safety and compliance information into a user-defined document. The content of the manual is customized through use of a simple assessment checklist that leads you to identify hazards specific to your work/research.

The assessment can be completed in as little as 10 minutes and the questions require little or no prior safety or regulatory knowledge. Using the Virtual Manual takes the guesswork out of which regulatory requirements and safe operating procedures are relevant to your work. The result is an online safety and compliance manual with content continually updated by EHS.

Since the Virtual Manual is continually being revised/updated, it's a good idea to review yours periodically. If you watch this section of the monthly listserv and read any relevant new or revised Safe Operation Procedures when listed, 'review' of your Virtual Manual should be a pretty easy task. The end/beginning of a calendar year might be a good time for such a review to start the new year off "thinking safety."

In any case, the EHS Safe Operating Procedures/Virtual Manual MUST be supplemented with *work/site-specific* procedures/protocols, as appropriate. The **Job Safety Assessments** SOP is a tool available to assist supervisors and PIs as they complete this step of developing a written Hazard Communication/Chemical Hygiene Plan.

Resources:

- **Virtual Manual** <https://scsapps.unl.edu/VirtualManual/>
- **Job Safety Assessments** SOP <http://ehs.unl.edu/sop/s-JSA.pdf>

**Remember...SAFETY IS AN ATTITUDE!**

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