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**National Institutes of Health  
Office of Research Services  
Division of Occupational  
Health and Safety**

Providing a safe and healthy environment for employees, patients and visitors.

*“Safe science and good science go hand-in-hand.”*

The articles in this Newsletter are intended to provide general summary information to the National Institutes of Health (NIH) community. They are not intended to take the place of either the written law or regulations. It is not NIH's intention to provide specific advice to readers of this Newsletter, but rather general information to help better understand how to prevent or reduce workplace injuries and illnesses.

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**Preventing hand injuries**

Your hands are often the best tool for the job. Unfortunately, hands-on work puts you at risk for hand injuries such as burns, bruises, abrasions, cuts, punctures, fractures, and chemical irritation. The Bureau of Labor Statistics reports that during 2013, private industry suffered 121,500 hand injuries that involved days away from work. This is more than 13 percent of all private industry injuries.

Many hand injuries can be prevented, however, by the simple act of wearing gloves.

**Glove selection**

The Occupational Safety and Health Administration (OSHA) requires your employer to select the appropriate hand protection for you to use. You are required to use hand protection when you are exposed to hazards. Your employer will base the selection on an evaluation of the hand protection's performance characteristics for the tasks to be performed, conditions present, duration of use, and the identified hazards.

When your employer assesses the hazards in your workplace, he or she considers the potential for hands to come into contact with:

- Tools or materials that might scrape, bruise, or cut;
- Sources of extreme heat or cold;
- Irritating chemicals;
- Blood or other potentially infectious materials; and

- Exposed energized electrical wiring or components.

**Glove types**

There is no one type of glove that will protect you from all types of hazards. After evaluating the hazards, your employer will select the right type of glove for the job.

**Durable work gloves**

Durable work gloves are commonly made from leather, canvas, metal mesh, or synthetic fibers. They provide protection against cuts, abrasions, punctures, burns, and sustained heat or cold. They are not chemical-resistant or electrically insulating, and their temperature-resistant properties are reduced if they become wet.

- **Leather gloves** protect against rough surfaces, moderate heat, moderately sharp edges and points, light blows, and sparks or chips.
- **Aluminized gloves** are usually used for welding, furnace, and foundry work. They have an insert made of synthetic materials that protect against heat and cold (such as Kevlar®).
- **Metal mesh gloves** protect against lacerations. Some types of cut-resistant gloves have woven fine metal strands along with cut-resistant synthetic materials to provide improved flexibility along

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## Preventing hand injuries *(continued from page 1)*

with cut resistance. Metal mesh gloves do not insulate from heat or cold.

- **Aramid fiber gloves** are made with a synthetic material (aramid) that is heat and cold-, cut-, and abrasion-resistant.

### Lighter-duty fabric or coated fabric gloves

These gloves are made of cotton or other fabric to provide varying degrees of protection.

- **Fabric gloves.** These gloves can protect against slivers, chafing, abrasion, and dirt. These gloves do not provide enough protection to be used with very rough, sharp, hot, or cold materials.
- **Coated fabric gloves.** Manufacturers coat the fabric with a vinyl or plastic material to improve the grip of the gloves.

### Chemical-resistant gloves

Gloves made of natural rubber, synthetic rubber, vinyl, or plastic protect you from chemical burns, irritation, and dermatitis caused by contact with solvents, acids, oils, greases, and other chemicals. The use of natural or synthetic latex gloves also reduces the risk of exposure to blood and other potentially infectious materials (OPIMs).

No one type of glove material resists all chemicals. Glove manufacturers provide chemical resistance charts to help your employer select the most appropriate chemical-resistant gloves.

- **Butyl rubber gloves** are highly impermeable to gases and they also resist oxidation and ozone. In addition, they resist abrasion and remain flexible at low temperatures. They protect against a variety of chemicals including acetic acid, sulfuric acid, hydrofluoric acid, and ketones.
- **Neoprene gloves** have good pliability, finger dexterity, high density, and tear resistance. They protect against gasoline, alcohols, hydrochloric acid, and alkalis.
- **Natural latex or rubber gloves** protect your hands from most water solutions of dilute acids, alkalis, and salts. They are frequently used to protect against contact with blood or OPIMs. Latex gloves have caused allergic reactions in some individuals. Hypoallergenic gloves, glove liners, and powderless gloves are possible alternatives for individuals who are allergic to latex gloves.
- **Nitrile rubber gloves** provide protection from chlorinated solvents such as trichloroethylene and perchloroethylene. Although intended for jobs requiring dexterity and sensitivity, nitrile gloves resist abrasions, punctures, snags, and tears.



### Electrically insulating

Electrically insulating gloves protect qualified employees from electric shock who need to work around energized parts. These gloves are marked on the cuff to indicate the maximum use voltages:

- Class 0 = 1,000 volts
- Class 1 = 7,500 volts
- Class 2 = 17,000 volts
- Class 3 = 26,500 volts
- Class 4 = 36,000 volts

It's especially important to always follow proper cleaning and storage procedures for electrically insulating gloves. Generally, durable protector gloves are worn over the electrically insulating gloves to help keep them from being damaged. Insulating gloves must be properly inspected for damage before each day's use and immediately after any incident that could have caused damage.

### Training

OSHA's PPE standard includes detailed training requirements. As an employee, you must know:

- When PPE is necessary;
- What PPE is necessary;
- How to properly put on, take off, adjust, and wear PPE;
- The limitations of the PPE; and
- The proper care, maintenance, useful life, and disposal of the PPE.



You must also demonstrate that you understand the PPE training you've received. Additionally, you must be able to demonstrate your ability to use PPE properly before being allowed to perform work requiring the use of the PPE.

Your employer will provide training which should include:

- Why hand protection is necessary (what workplace hazards can injure your hands).
- How the selected gloves will protect you.
- What limitations the gloves have.
- When you need to wear the gloves.
- How to wear and remove the gloves properly.
- How to get a good fit.
- How to inspect the gloves before use. For example, look for tears, rips, and contamination. To inspect chemical-resistant gloves, put air into the glove to check for pinholes and leaks.
- How to identify signs of wear such as cracks, holes, or cuts, and thinning or discoloration.
- How to clean and store protective gloves.

# Safety focus: Gear up for winter hazards

During the winter months, you can be exposed to hazards when performing outdoor tasks such as removing snow, driving, and working with powered equipment.

## Shoveling

Shoveling snow can be a strenuous activity, particularly because it can bring health risks. There is a potential for exhaustion, dehydration, back injuries, or heart attacks.

During snow removal there are safety measures you can take to help avoid injuries. You should:

- Warm-up before the activity;
- Scoop small amounts of snow at a time; and
- Where possible, push the snow instead of lifting it.

Additionally, proper lifting techniques will help avoid back and other injuries when shoveling snow. Be sure to:

- Keep your back straight;
- Lift with your legs; and
- Avoid turning or twisting your body.

## Driving

Always follow safe driving practices whether you are operating your own vehicle or a company vehicle. Your employer should implement an effective maintenance program for all vehicles and mechanized equipment that you are required to operate.



You should be properly trained on inspecting the vehicle's systems to ensure that they are working properly. Inspect the following vehicle systems:

- **Brakes.** Check that the brakes provide even and balanced braking. Also, check the brake fluid level.
- **Cooling system.** Ensure the cooling system has a proper mixture of 50/50 antifreeze and water, and that it is at the proper level.
- **Electrical system.** Check the ignition system and make sure that the battery is fully charged and that the connections are clean. Check that the alternator belt is in good condition with proper tension.
- **Engine.** Examine all engine systems.
- **Exhaust system.** Look for exhaust leaks and that all clamps and hangers are snug.
- **Tires.** Check the tires for proper tread depth and for signs of damage or uneven wear. Make sure the tires are properly inflated.
- **Oil.** Check that oil is at the proper level.
- **Visibility systems.** Inspect all exterior lights, defrosters (windshield and rear window), and wipers. Install winter windshield wipers.

It is also recommended that you have an emergency kit with the following items in your vehicle:

- Cellphone or two-way radio;
- Windshield ice scraper;
- Snow brush;
- Flashlight with extra batteries;
- Shovel;
- Tow chain;
- Traction aids (bag of sand or cat litter);
- Emergency flares;
- Jumper cables;
- Snacks;
- Water;
- Road maps; and
- Blankets and a change of clothes.

## Powered equipment

It is important to make sure that powered equipment, such as snow blowers are properly grounded to protect you from electric shock or electrocution. When performing maintenance or cleaning, make sure the equipment is properly guarded and is disconnected from power sources.

Snow blowers can also cause lacerations or amputations when operators attempt to clear jams with the equipment turned on. Never attempt to clear a jam by hand. First, turn the snow blower off and wait for all moving parts to stop, and then use a long stick to clear wet snow or debris from the machine. Keep your hands and feet away from moving parts. Refuel a snow blower prior to starting the machine; do not add fuel when the equipment is running or when the engine is hot.

## Preventing slips

While performing outdoor work in the winter can bring potential hazards, simply walking outside can be dangerous as well. Be careful when stepping outdoors during or after a winter storm. Following these precautions will help reduce your likelihood of injury:

- **Wear proper footwear.** A pair of insulated and water resistant boots with good rubber treads is ideal for walking during or after a winter storm. Another good option is a pair of rubber over-shoes with good treads to wear over your street shoes during the winter months.
- **Take short steps and walk slowly.** This will help if you need to react quickly to a change in traction when walking on an icy or snow-covered walkway.



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## Managing weight loss

*"Walking is the best possible exercise. Habituate yourself to walk very far."*

Thomas Jefferson



**Gradually build changes into your routine to make them last.**

Losing weight can seem daunting, but it's a worthwhile journey that can begin with a few simple steps.

Start by integrating healthy behaviors into your routine. Counting calories, exercising, and restricting high-calorie foods are all effective ways to lose weight, but setting goals that are too aggressive reduces the likelihood that you'll stick with them.

Instead of vowing to exercise for an hour a day every day, try a 15-minute walk three days a week. Rather

than a drastic diet change, eat a healthy breakfast daily and have a serving of vegetables with supper.

Small changes are more likely to become habits and part of your lifestyle. Start with one or two realistic goals and add more over time.

If a setback occurs, don't give up.



Forgive yourself for the slip-up, and think about what you might do differently next time.

Once a goal is achieved, reward yourself. Buying a new outfit or spending a morning biking with friends lets you enjoy the results of your healthier lifestyle.

### Solving the weight loss puzzle

Piece together a weight loss plan that works for you. Start with one or two healthy changes, and gradually build more into your routine.

