

Safety

Leader's Discussion Guide



2008

Pandemic planning
Slips, trips and falls
Handling and storing flammable,
and combustible liquids
Motor vehicle safety
Heat stress
Protecting young workers
The role of a safety committee
Green construction
Developing effective supervisors
The colors of safety
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Dear safety leader:

Focusing on safety and health in the workplace improves the safety and quality of life of your employees and ultimately all Ohioans.

Success begins with safety and health management programs, which add value to your business. Just one serious workplace injury may affect your company's bottom line through workers' compensation payments, medical expenses and lost productivity.

An essential component of effective safety and health programs is workplace training. For example, can your employees explain every existing and potential hazard to which they are exposed? Do they know how to protect themselves and their co-workers from these hazards? Can they explain precisely what they must do in the event of a disaster or other emergency?

Employees develop the knowledge and skills they need to understand workplace hazards through comprehensive training programs. Safety and health training is vital to every workplace. To share their safety perspectives, the Society of Ohio Safety Engineers and BWC's Division of Safety & Hygiene developed this *Safety Leader's Discussion Guide*.

This guide encourages participation and interaction by employees. Each month covers a different safety topic, including planning for pandemic flu, preventing motor-vehicle accidents, creating safety committees, protecting young workers and more.

Including safety topics in staff and safety meetings is a best practice. Safety and injury prevention contribute to a rewarding and worker-friendly environment improving the economy in Ohio and ultimately your company's bottom line.

Learn more about workplace safety during BWC's Ohio Safety Congress & Expo, slated for April 1-3, 2008, at the Columbus Convention Center. The event is free and open to the public.

Sincerely,



Mark A. Garver
Acting Superintendent
BWC's Division of Safety & Hygiene



Pandemic planning

By Mark J. Mullins

Before you begin

Contact your human resources department to see if your organization has a pandemic preparedness plan. If so, review the plan before your session to identify key points to review and discuss. If your facility does not have a pandemic plan, use this information to help develop one. Be sure to include a cross section of employees to develop the policy. Most county health departments already have a plan in place, and they can assist you in developing one for your company.

Note: See www.pandemicflu.gov/plan/businesschecklist.html, for an example of a disaster plan and a checklist of items to consider when designing a plan.

Introduction

Influenza, also known as the flu, is a contagious respiratory disease caused by viruses. In the United States, the flu season begins in the fall and ends in the spring. The type of flu you get during this season is called seasonal flu.

A new type of flu virus sometimes emerges to which the public has no resistance. The lack of immunity allows the virus to spread rapidly and easily from person to person worldwide. The virus may impact communities and workplaces in a very short time. This kind of flu is called pandemic flu.

Another recently discovered type of flu is the Avian Influenza, better known as bird flu. The H5N1 virus that infects birds and domestic poultry causes this flu. This virus has infected humans, and it results from human contact with infected poultry or surfaces contaminated with secretions/excretions from infected birds.

How a pandemic influenza could affect your workplace

When an influenza pandemic occurs, it will be widespread and severe affecting many worldwide. Depending upon the circumstances, the pandemic may last from several months to several years. Businesses need to prepare for the worst-case scenario.

Such a pandemic will affect employee absenteeism. Experts predict as many as 40 percent of the work force will be absent at one time. One of the reasons for the high absence rate will be due to employees having to stay home to take care of sick family members.

Another area to consider is the interruption of businesses. If 40 percent of your employees are absent that will impact the delivery of goods you need to run your business. This will especially affect your supply chain.

Group action

Stimulate group discussion on what other services may be affected, and capture this information on a flip chart.

How to maintain operations during a pandemic

By protecting the health and safety of your employees, you can help protect your company's business and lessen a pandemic's impact. Pandemic planning is critical to prepare for limited business operations.

Develop a plan

When designing a pandemic emergency plan, consider these options:

- Identify a pandemic management team.
- Identify key staff members and backups for decision making and operations.
- Identify the operation's key elements that a pandemic may affect:
 - o Evaluate supply-chain issues;
 - o Assess critical service provider needs;
 - o Determine power, water, food, supply needs, availability and alternatives;
 - o Evaluate potential remote-computing capabilities;
 - o Identify potential human resources issues specific to the site.
- Work with the local health department to identify potential business areas that need to be addressed.
- Prepare and plan for working with fewer employees.

- Work with your supply chain to ensure continued operations and services.
- Consider business continuity by working from your home.
- Identify your business-essential positions, and develop a strategy to ensure you fill these positions.

What employees can do to stay healthy

These steps may help prevent the spread of respiratory illnesses, such as the flu:

- Cover your nose and mouth with a tissue when you cough or sneeze.
- Wash your hands often with soap and water. If you are not near water, use an alcohol-based hand cleaner.
- Avoid close contact with people who are sick. When you are sick, keep your distance from others to limit them from getting sick.
- If you do get the flu, stay home so you do not infect others.
- Do not touch your eyes, nose or mouth to keep the germs from spreading.

Summary

Develop a written plan and train your employees. To plan for you and your family members' well-being, consider using the Pandemic Planning Household Preparedness check list that is available at www.ohiopandemicflu.gov/docs/A-ZHousehold.pdf. Get informed. Be prepared.

Mark J. Mullins is a certified safety professional and a certified hazardous materials manager. Mullins is past president of the Society of Ohio Safety Engineers and is vice-president of the Northern Ohio Chapter of the American Society of Safety Engineers. He also is on the board of directors for the Greater Cleveland Safety Council.

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Slips, trips and falls

By Warren K. Brown

Before you begin

Review incident information from your organization focusing on slips, trips and falls. Summarize the facts as an aid in your safety talk. Be aware of the information so you can weave your organization's history into your presentation.

Introduction

Slips, trips and falls are a significant cause of injuries both at work and away. For example, the 2007 edition of the National Safety Council's *Injury Facts* reports there were 284,380 non-fatal slips, trips and falls and 799 fatal slips, trips and falls, at work in 2006.

Falls to the same level are a common cause of on-the-job injuries. These facts should alert you to the importance of recognizing hazards that can cause slips, trips and falls and the value of establishing programs to inspect and correct the hazards.

Remember, these types of incidents can occur anywhere—not just on the job. Therefore, it is essential we promote vigilance and safe practices both on and off the job. These actions will result in fewer incidents. These types of incidents can have an adverse effect on the workplace—no matter where they occur.

Discussion

Begin the session by taking a poll of the participants by asking if any of them have experienced a slip, trip or fall and have them give a brief explanation of what occurred. Ensure the focus is not just at the workplace to support the idea slips, trips and falls can occur anywhere.

Begin with slips and have a list of potential causes that include:

- Spills causing wet surfaces;
- Weather-related surface conditions;
- Shoe soles not compatible with floor surfaces;
- Incomplete floor cleaning;
- Debris collecting on walking surfaces;
- Non-uniform floor surface;
- Carpeting or mats not secured;
- Transitional areas such as doorways and ramps.

What can you do to resolve these issues?

- Clean up spills quickly and block off wet areas;
- Have walk-off mats and a snow-removal program;
- Urge employees to maintain good shoe soles;
- Rinse floor detergents and dry the floor;
- Keep debris cleaned from walkways;
- Smooth out floor areas where necessary;
- Tape or otherwise secure floor coverings;
- Mark ramps so the slope is apparent.

Next, let's look at what may result in trips:

- Hoses and cables on floor;
- Uneven walking-working surfaces;
- Debris allowed to collect in walkways;
- Inadequate walkway lighting;
- Obstructed view of walkway;
- Wrinkled or unsecured carpeting or mats.

Steps that you can take to reduce these hazards include:

- Run hoses and cables through walkover devices or overhead;
- Repair and mark floor areas that may be uneven;
- Good housekeeping can keep debris under control;
- Keep walkways clear of intrusions that may obstruct activity;
- Secure floor coverings to prevent wrinkling.

List examples of fall hazards, which can include:

- Faulty ladders;
- Improper ladder use;
- Wrong ladder for the job;
- Using makeshift ladders such as chairs or boxes;
- Not using stair handrails when taking the stairs;
- Ramps, docks and floor holes;
- Getting out of vehicles.

How can we resolve these potential fall hazards?

- Prior to climbing, inspect ladders;
- Set the feet on a stable surface and use the proper lean angle;
- Select a ladder that fits the job at hand;
- Never stand on a chair;
- Use the handrail when taking the stairs;
- Mark ramps, docks and holes so they are highly visible;
- Use vehicle grip bars or handles to get in and out of vehicles.

Conclusion

Slips, trips and falls usually result from something that you can easily resolve. Good housekeeping, proper selection of footwear, signs to warn of temporary conditions and staying

alert to your surroundings are good methods to stay safe. Training everyone to maintain a safe workplace is also helpful. Training in walking and maintaining body balance can help reduce the damage potential when encountering unusual conditions. Using a combination of behavioral and environmental solutions may be the best way to reduce the potential for slips, trips and falls.

Group activity

Now that your group has a better idea of conditions that may result in a slip, trip or fall, ask them to take another tour of their work areas and point out problem areas. Keep an action-planning chart posted in the area to follow up on fixes for conditions they find.

Quiz (Circle T for true or F for false).

1. Shoe soles could result in a slip or trip. T F
2. When you encounter liquids on walking surfaces, walk around it. T F
3. It is OK to stand on a chair just for a moment. T F
4. Setting a ladder on a level, secure surface is good. T F
5. Good housekeeping is a way to maintain walking surfaces. T F

Answers: 1. T; 2. T; 3. F; 4. T; 5. T.

Warren K. Brown is a certified safety professional, an associate in risk management and a certified safety and health manager. He is a supervisor of safety at DMAS Ltd. in Moraine and a former safety lecturer at Dayton's Sinclair Community College. A General Motors Safety Fellow and Safety Professional of the Year for Ohio and Region 7 of the American Society of Safety Engineers (ASSE), Brown will be ASSE's president from 2008 to 2009.

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Publications:

Injury Facts; National Safety Council; 2007 Edition

Slips, Trips & Falls: Taking the Right Steps; Coastal Training Technologies Corp, 2005

Take a Surefooted Approach Toward Slips, Trips and Falls; National Safety Council, 2007

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Handling and storing flammable and combustible liquids

By Mike Ely

Before you begin

Review the master inventory list for your facility. Determine what flammable and combustible liquids are in your facility and where they are located. Obtain copies of the material safety data sheets (MSDSs) for these flammable and combustible liquids, and become familiar with the terms and layout so you can discuss them with your employees. If possible, obtain a copy of the label or one of the containers to use as an example for your discussion.

Introduction

Flammable and combustible liquids come with many names and in many containers. We automatically recognize some and some we do not. It is important to know the physical characteristics of chemicals that are present in the workplace, how to handle them safely and how to store and dispose of them in a safe and approved manner.

Discussion

Flammable and combustible liquids are in workplaces of all kinds. You can find them in small quantities like a small tube of glue, or they can be in large industrial containers like drums or vats. The packaging containing these flammable and combustible liquids may or may not alert the user to the contents' hazards.

First, employees need to know the chemical's physical characteristics. They can find this information on the MSDS. It contains information about the flash point, boiling point, fire-fighting methods, personal protective equipment and safe handling methods.

Ignition sources

Ignition sources are a primary concern when working with or around flammable and combustible liquids. Because Ohio does not allow smoking in the workplace, one potential source of ignition no longer exists. However, other sources remain, which you must control. Welding sparks, electrical devices not rated for flammable atmospheres, frictional heat and sparks from tools are ignition sources, which you must eliminate and control when using flammable liquids.

Another major ignition source is static electricity. When dispensing flammable liquids, you must safely discharge the static charge. You do this by bonding the container you are dispensing into the container you are dispensing from with the proper electrical pathway. Then, you must provide the container you are dispensing from with a proper electrical path to ground and drain that static charge to the earth. Use the proper pump to dispense flammable liquids. Using compressed air to pump flammable liquids from a container is not allowed.

Store flammable and combustible liquids in the proper containers when you are not using these liquids. Flammable liquid containers should be:

- Fire resistant;
- Allow for bonding and grounding with the dispensing container;
- Have a spring-loaded lid that will relieve internal pressure under fire conditions;
- Properly labeled to identify the contents.

Storage cabinets

Use flammable liquid storage cabinets to store flammable and combustible liquids. A maximum of three in any fire area is allowed (Six are allowed if the area has sprinklers). The cabinet must be sturdy. If it is metal, it must have double-wall construction. Also, it needs a self-closing door, which will lock at three points (top, bottom and middle) and have at least a 2-inch sill at the bottom.

You can build wooden flammable cabinets, but they must meet the requirements of 29 CFR 1910.106(d)(3)(ii)(b). Indoor flammable liquid storage rooms must be at least one-hour fire resistant with liquid tight walls and have at least a 4-inch high sill or ramp to prevent flammable liquids from escaping. The room must also have an approved, self-closing fire door and approved wiring and ventilation.

Flammable and combustible liquids have many uses in workplaces and homes. Used, handled and stored safely, they can greatly improve our ability to do many jobs. However, if not used properly, they can cause tremendous damage and potentially lead to serious injury or death.

To ensure you understand the liquid's hazards, read the MSDSs carefully before using them. In addition, have the right equipment to do the job safely, and know how to store the unused portion. When in doubt, contact your supervisor or the manufacturer to get more information.

Group action

Ask the group members:

- What flammable and combustible liquids are in your work area? (Examples may include gasoline, acetone, alcohol, xylene and other solvents or fuels.);
- What containers should you use for storing flammable and combustible liquids? (Examples may include manufacturer-shipping containers, flammable liquid storage cans, flammable liquid storage cabinets or rooms, etc.);
- How should you dispense flammable liquids? (Examples may include by bonding and grounding, containers filled outside vehicles, proper flammable liquid pumps, etc.);
- Where are the MSDSs located in your facility for more information? (Answers will vary based on company practices.)

Michael Ely is a certified safety professional and a professional member of the American Society of Safety Engineers. He has 25 years experience with BWC's Division of Safety & Hygiene where he is a safety technical advisor.

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Web sites

- Canadian Centre for Occupational Health and Safety: http://www.ccohs.ca/oshanswers/prevention/flammable_general.html
- National Institute for Occupational Safety and Health Flammable Liquids Check list: <http://www.cdc.gov/niosh/docs/2004-101/chklists/r1n39f~1.htm>
- www.osha.gov/dccsp/ote/library/flammable_liquids/flammable_liquids.html
- Workplace Group: <http://www.workplacegroup.net/articles/article-flammable-liquids.htm>

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Motor vehicle safety

By Amy Stewart

Before you begin

Ask your participants these questions: How safe is the operation of your motor vehicle? What are typical causes of motor vehicle crashes, incidents and events? What do we check to prevent motor vehicle problems?

Introduction

Warm-up exercise – group discussion

List types of undesirable motor vehicle events and how we compensate for them, or how we can improve in these three categories.

Category 1: Vehicle condition prevention

Possible answers include: Preventive maintenance; repairs; vehicle abuse; vehicle assignments; clearance; collisions; routine maintenance; vehicle cleanliness; care, pride, policy/procedures/training; reflective markings, reflectors, and lights; daily, weekly, monthly, quarterly or annual inspections; vandalism, ventilation, securing loads for transport; radio and communication devices working.

Category 2: Driver/operator condition

Possible answers include: Self-care; well rested; well nourished; groomed; uniformed; proper training for the vehicle; route is established/planned in advance; safety-belt use; safe lifting/handling; slips/falls; strains/sprains. Other answers may include: Speeding; distractions, fatigue, courteous, abides by rules of the road as well as organizational policies, procedures and protocol; mindful of traffic, congestion, other drivers, other vehicles and pedestrians; vandalism; weather; care for vehicle from documented inspection and log to ensure vehicle is maintained.

Category 3: Environment

Possible answers include: Traffic density; signs; lights; markings; parking areas; communications; detours; construction zones; other drivers and vehicles; non-motorized traffic users, including animals, pedestrians and bicycles – non-licensed or off-road; vehicles, such as yard equipment, forklifts and lift trucks; weather.

Discussion question:

What can we do to prevent accidents?

Group discussion #1 (Vehicle condition)

- Q. What are the leading causes of fatalities for motor vehicles?
 - A. Brakes; other vehicles; speed; alcohol; space management
- Q. What contributing factors lead to these events and what can we do to keep them from happening?
 - A. Routine inspections; preventative maintenance; following policies and procedures; education and training; enforcement and engineering
- Q. What can we do about our responsibilities for vehicle conditions?
 - A. Drive vehicles only if they are in working condition. Inspect and maintain vehicles. Make repairs as needed. Keep them in top shape.
- Q. Discuss newer designs of vehicles. What hazards do these new designs create or do you believe they contribute to crash prevention?
 - A. Air-ride seats; computer feedback, global positioning system and new technologies

Group discussion #2 (driver/operator condition)

- Describe ways to inform drivers and operators of motor-vehicle safety (federal, state and local laws, and ANSI Z15.1 standard).
- Discuss contributing factors to fatalities from the perspective of driver condition and how to prevent them.

- From your organization's trend reports, share a typical motor-vehicle crash scenario, and discuss how the accident could have been prevented. If not preventable, draw real experiences from the group members.
- Discuss the feasibility of having a crash and injury review team at your facility and acknowledge the benefits and disadvantages.

Group discussion #3 (environment)

- Q. What are ways to use communication in the traffic/transportation/motor-vehicle environment?
- A. Signage, colors, audible/visual alarms, signals, markings, traffic patterns and gestures
- Q. What are some environmental factors that contribute to motor-vehicle crashes?
- A. Engineering design, road surface, lack of warning, road construction, the human element and weather
- Q. What can we do as drivers to ensure motor-vehicle safety and survive on the road?
- A. Concerns range from aggressive or distracted driving, mobile-telephone use and impaired drivers. Be courteous. Take care of yourself and your vehicle. Disengage and keep adequate space away from hazards. Follow driving rules and regulations.

Check list/guidelines for motor-vehicle safety

1. Pre-trip –
 - o Vehicle is clean, fueled and maintained.
2. Document completed maintenance schedule for operations and maintenance.
3. Look for damage or vandalism and report it when it is appropriate.
4. Ensure employees recognize their own driving conditions and strive to be safe.
5. Realize environmental changes are a part of motor-vehicle safety, and be alert for:
 - o Traffic density;
 - o Non-motorized highway users;
 - o Signs, lines, markings and lights;
 - o Clues to the environment that can cause crashes.

Methods and strategies

Through group discussion, the participants will raise awareness of hazards for motor vehicles; incorporate hazard identification into the workplace through safety committees; peer-to-peer feedback and employee suggestions. The leader will offer feedback on employee suggestions to upper management when appropriate and support job hazard analysis, as well as crash and injury review when applicable.

Concluding action

Workers must not only be mindful of what they are doing, but they should be aware of the actions of those around them. Raise the awareness of the dangers surrounding motor vehicles in order to identify opportunities for improvement. Resources are available internally, locally, statewide and through federal agencies to support the direction of motor-vehicle safety. Your time, level of enthusiasm and energy are the only limitations.

Determine the greatest exposure to your organization, search for factual information to support solutions for preventing motor-vehicle accidents and work with employees to identify what works best for your organization.

Group actions

Safety committee – Design a list of improvements that you can make in your organization's motor vehicle area. Prioritize these suggestions beginning with those that are of minimal cost to those that are substantial. Get upper management actively involved. Instill a "not on my watch" attitude about these improvements.

Tailor an orientation-training program for employees who operate motor vehicles in any capacity. Include procedures, rules and guidelines for keeping your company injury/fatality/damage-free. Continue with refresher and follow-up training that includes analysis and review of incident rates to give feedback to those on the front lines who may benefit from risk-exposure information.

Amy Stewart is the project director for a federal Safe Schools/Healthy Students grant at Highland Local Schools through the Department of Education, Health and Human Services and the Justice Department. She is a certified safety professional and has more than 20 years experience in designing fleet-safety training and emergency-response programs.

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Regulations

- 49 CFR
- ANSI/ASSE Z-15.1-2006, Safe Practices for Motor Vehicle Operations
- Digest of Ohio Motor Vehicle Laws, www.bmv.ohio.gov; Responsible Driver Handbook, www.PublicSafety.ohio.gov

Publications

- National Institute for Occupational Safety and Health. Work Related Roadway Crashes, Who's At Risk? NIOSH Publication No. 2004-137, March 2004.

Web sites

- American Society of Safety Engineers (ASSE): www.asse.org
- National Institute for Occupational Safety and Health: <http://www.cdc.gov/niosh/homepage.html>
- National Safety Council (NSC): www.nsc.org
- US Department of Transportation: www.dot.gov

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Heat stress

By Andrew M. Pawuk

Before you begin

Ask your participants if any warm or hot conditions exist at their workplaces that add stress or hazards during work. Question them about the hazards. For example, slippery and sweaty palms, dizziness or the fogging of safety glasses are several hazards present during warm conditions. In addition, explain that a worker's mental alertness and physical performance may decrease when the body's temperature increases or the worker becomes irritable or angry due to the heat.

The session's purpose is to help you better understand the hazards associated with heat-induced disorders and to allow you and your co-workers to maintain your attention to your work tasks. This will help you avoid injury or illness.

Introduction

Your body maintains a constant internal temperature when you are in a hot or warm environment by automatically increasing your heart rate, which increases your blood circulation through the skin and releases fluid through the sweat glands. If your body's heat loss is not adequate, the sweat glands will increase the quantity of sweat onto the skin's surface and try to increase fluid evaporation that will cool down your body.

When the air temperature exceeds the body's temperature or if the humidity is high, the necessary evaporation cannot take place easily. It is also difficult for cooling evaporation to occur. Your body will then increase the blood flow to your skin. This results in less blood available for your internal organs and muscles. Finally, your strength declines, fatigue occurs and alertness and mental capacity may decrease.

Signs, symptoms and first aid

You should know the signs and symptoms of several heat-related illnesses and the proper action to take to correct the situation.

- Heat stroke is life threatening and occurs when the body cannot regulate temperature and sweating is inadequate. The skin is hot and dry. The body's temperature is 106°F or more. There can be mental confusion, a delirious state, convulsions or unconsciousness.
- Seek medical assistance immediately.
- First aid should include relocating the person to a cool area, soaking the clothing and fanning

the person to increase body cooling. This is a life-threatening illness, which requires treatment at a medical facility.

- Heat exhaustion occurs when there is a large loss of fluids by sweating and unbalanced replacement of fluids. Treatment should include removing the person to a cool area and having him or her drink liquids.
- Heat cramps are muscle spasms, which occur when a person sweats profusely. The person should stop any activity and drink liquids.
- Fainting may occur when blood vessels in the lower extremities dilate and cause inadequate circulation to the brain. After lying down, the person should quickly recover.
- Heat rash occurs when evaporation does not easily remove sweat from the skin's surface. The sweat ducts become clogged and a skin rash appears. Resting in a cool spot and regular bathing can prevent this condition.

Risk factors

There are several other factors that affect the body's ability to cool itself during extremely hot weather. When the humidity is high, sweat will not evaporate as quickly. This prevents the body from releasing heat quickly.

The type and amount of clothing you wear influences how hot you feel. In particular, it is important to wear a hat with a three-inch brim when you are in the sun. Avoid covering your neck because that's where you get a lot of heat loss. To cool down, put a moist towel around your neck.

Your diet and metabolic load also influence your heat threshold. Eat lighter during the summer, including fruits, vegetables, salads and proteins. The body needs more fluids when it is hot. You perspire more in the summer, and you need to replace your fluid loss. Therefore, drink water before, during and after laboring or exercising to replace body fluids lost by sweating.

Other conditions that can limit the ability to regulate temperature include old age, obesity, fever, dehydration, heart disease, poor circulation, sunburn, and drug /alcohol use.

Almost everyone can adjust to heat exposure. It normally takes five to seven days for your body to adjust to the heat and for you to adjust with less strain and distress. If possible, a gradual adjustment will allow you to acclimate to the heat.

Safety tips

It is important to replenish fluids during hot conditions. Drink appropriate liquids before you become thirsty to maintain a proper fluid balance. The Occupational Safety and Health Administration recommends one cup of water

every 15 minutes. It's important to do this all day, not just during rest breaks. Other safety tips include:

- Avoid caffeinated and alcoholic beverages;
- To allow the air to circulate, wear light-colored, loose-fitting clothing;
- Block out direct sun or other heat sources when needed;
- If possible, perform strenuous work during cool periods;
- There is about a 30-minute lag time between the time you need fluids and you are thirsty. If you wait until you are thirsty, you may be at risk of dehydration because by the time your body signals you are thirsty, you are 2-percent dehydrated. Once you are dehydrated, it is difficult to replace the fluids. In most situations, water is the best fluid to drink;
- Drink cool water rather than hot or very cold water. Cool water absorbs more quickly into the body.

Conclusion

When you work in hot environments you need to take proper precautions to prevent a heat-related illness. Be aware of your co-workers' physical conditions and look for signs and symptoms of heat-exposure illnesses. If possible, acclimate yourself to the heated conditions. In addition, wear lightweight, loose-fitting, light-colored clothes which allow perspiration to evaporate and help you maintain your body fluids. Do not wait until you are thirsty to drink more liquids. To stay hydrated, drink plenty of fluids before, during and after being in warm or hot conditions.

Quiz (Circle T for true and F for false.)

1. The body naturally tries to cool itself off when it is heated. T or F
2. Heat stroke is a life-threatening condition which requires medical treatment. T or F
3. You should wait until you are thirsty before consuming liquids. T or F
4. Your body can acclimate itself to hot conditions. T or F
5. It is important to recognize the signs of a heat-related illness. T or F

Answers: 1. T; 2. T; 3. F; 4. T; 5. T.

Andrew M. Pawuk is the safety and security manager at Lucas Metropolitan Housing Authority in Toledo. He previously served for 18 years as the safety director for major hospitals in Toledo and Columbus; as a safety and health specialist for Columbia Gas of Ohio; and as a private consultant.

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Protecting young workers

By Joseph Hammond

Before you begin

This session covers the topic in a question-and-answer format. Please adapt this to your situation by including a discussion of seasonal changes at your facility and the responsibility all employees have to protect young workers.

Introduction

Individuals coming into the job market frequently lack the knowledge and skills required in the industrial and construction environment. The classroom may provide certain training, but it frequently falls short in preparing youth for the conditions they will face.

That's where the employer is charged with facilitating their safe entry into the operation's general flow. In fact, statistics show young and inexperienced workers are five times more likely to be injured at work in their first four weeks on a new job.

You can all recall your own attitude with your first job, and you have seen others who your company has added as associates.

Discussion

- Q.** What are feelings you believe new, young employees bring with them?
- A.** You may hear comments like:
- Inexperience (Unfamiliar with tasks and unable to recognize hazards);
 - Lack of awareness of rights (Unwilling to ask questions or question work practices);
 - Lack of confidence (Eager to please, which can mean they take on tasks they are unprepared to do);
 - Fear (Afraid to speak up or ask questions);
 - Feeling of immortality (Invincible and indestructible).
- Q.** What are the attitudes of some in supervision?
- A.** Responses will vary, but you may learn that: Supervisors may give young workers physically demanding or boring, repetitive tasks; Supervisors do not take safety as seriously as production.

Q. Are you aware of what jobs are restricted by law that youth under 18 years of age may not perform?

- A.** Among responses are those federal and Ohio law forbid, including:
- Coal and metal mining, logging and quarrying;
 - Manufacture of brick, tile, and clay construction material;
 - Wrecking and demolition;
 - Meatpacking, slaughtering and rendering;
 - Operating power-driven bakery machines including mixers;
 - Operating paper balers and compactors;
 - Roofing and excavation;
 - Operating circular and band saws and guillotine cutters.

(Note: Additional restrictions exist for those who are 15 years of age and under.)

Q. What should we do to protect youth and/or employees who are new to the workplace?

- A.** See if you can get responses similar to the answers below.
- Begin by showing them the same respect you reserve for other employees.
 - Take inexperienced employees onto the floor and show them the hazards.
 - Provide job-specific safety training by reviewing job safety analyses.
 - Observe and coach new workers. Quiz workers on where hazards lie (remind and reinforce).
 - Explain their rights, which are:
 - o The right to know;
 - o The right to participate;
 - o The right to refuse unsafe work.

Joseph Hammond is a certified professional environmental auditor and occupational safety and health technologist. After a 27-year career with BWC, Hammond now provides safety training and consulting services to clients throughout Ohio. He is an authorized OSHA 10-and 30-hour course trainer.

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Regulations

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The role of a safety committee

By Dan Stockwell

Before you begin

Before the meeting, have the following materials available for discussion:

- An example of the safety committee's agenda sheet;
- An example of the safety committee's safety inspections/projects action register.

Introduction

A safety committee with a purpose and objectives can play an important role in an organization's health and safety process. However, for a committee to be effective, the organization should clearly define the committee's role.

It is important to have representatives from both the hourly and salary ranks serve on the committee. Depending on your organization's structure, it is generally good to have representatives from each department, because the committee's decisions may affect the entire organization. Committee members may be volunteers or persons selected by their departments.

Mission

A safety committee should develop a mission statement, which outlines the role of the committee and its members. Some elements, which you should consider in developing a mission statement include:

- The committee's purpose;
- Member roles and expectations;
- The committee's structure.

The mission statement should be one of the first action items the committee accomplishes.

A committee's basic structure should include a chairperson to coordinate and direct the committee, and a secretary to assist with meeting minutes and other communications, such as following up on projects or assignments. Some organizations have assistant chairpersons to help the committee. This structure serves as a training process and assists with the development of committee members.

Committee functions

Depending on the organization's structure, some basic committee functions may include:

- Developing a yearly health and safety plan of action, including goals, and devise a process to track the plan's elements;
- Conducting periodic health and safety inspections to identify and correct physical conditions as well as unsafe work practices and procedures;
- Reviewing or investigating accidents, injuries, and near misses, as well as recommending corrective actions;
- Coordinating and/or conducting health and safety training;
- Developing health and safety procedures, and policies.

The committee should meet on a periodic basis to discuss action items established by the committee. This follow-up and the completion of action items can provide committee members with the encouragement to further participate in the health and safety process.

Summary

Employee involvement through a safety committee can facilitate cooperation and communication in an organization. However, a safety committee cannot take the place of a worker's personal role and responsibility for health and safety. A safety committee is a part of the employer's overall health and safety process.

Dan Stockwell, a certified safety professional and a certified industrial hygienist, is a senior regional health and safety administrator for O-I (formerly known as Owens-Illinois) in Zanesville. He is a past president of the Society of Ohio Safety Engineers and has more than 25 years of experience in occupational health and safety.

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Green construction

By Tim Governor

Before you begin

Ask the participants what green building and sustainable building means to them. Have them tell you ways that this type of building will help the working environment and have them give examples.

Introduction

The terms green building and sustainable building are finding more use in construction activities, as well as the news media and trade journals. The terms have come from associations focused on the best use of resources to construct and maintain buildings for the future. The intent is to create and preserve a healthy and safe environment for a facility and its occupants during and after construction, as well as throughout the building's life.

The U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) rating system provides a tiered level of achievement for buildings seeking LEED certification. Achievement levels are platinum, gold, silver and certified depending upon the number of green requirements the design and construction process meet. LEED designates buildings that exceed its posted requirements as sustainable.

To summarize, green construction seeks to:

- Lessen the impact on the local environment;
- Promote energy efficiency;
- Effectively use resources;
- Create a safe healthy environment for construction workers and building occupants.

Given this broad definition, what are practices that promote green or sustainable principles, which you can implement at the construction site? (If your company is working on a project seeking LEED certification, review the LEED specific-project activities with the architect and general contractor.)

Common sense responses may include the following:

- Recycling—Green construction provides opportunities for extensive reuse or recycling of building demolition and construction materials. Contractors may reuse some materials on site, and send other materials to recycling centers;
- Rainwater and gray water (used in the home, except water from toilets, is called gray water) — Dish, shower, sink, and laundry water comprise 50 percent to 80 percent of residential wastewater. Businesses may reuse this water for other purposes, especially landscape irrigation;
- Energy-efficient equipment — Energy star equipment for home or commercial use consumes less energy than non-rated equipment. Successful buildings can use up to 35 percent less energy than standard construction;
- Natural lighting — Optimal use of windows and skylights, as well as design features, such as atriums, can minimize the use of electrical lighting fixtures;
- Low emission adhesives and coatings — After application, these items, also called low volatile organic compounds emitting materials, do not release unpleasant odors or noxious fumes.

Newer green building technologies may also include the following features:

- Solar panels — You may use these panels to generate heated water or to generate electricity;
- Permeable paving — This pavement permits the passage of rain water, reducing the size and scope of storm-water systems and surface runoff to storm-water drainage systems;
- Reflective coatings — When applied to rooftops, they reflect the sun's rays and reduce the amount of heat absorbed on hot days. Window coatings allow visible light in, but they reflect infrared (heat) light;
- Enhanced ventilation features — This ventilation system provides fresh air to construction workers during construction and, upon completion, to building occupants. These features may include sensors and monitors that measure indoor air-quality pollutants and trigger the ventilation system to provide more fresh air to indoor spaces.

A recent study found that most construction workers perceived green construction sites to be safer than conventional construction.

Whether you are working on a green building project or not, odds are that you will be soon. Estimates predict there will be more than 5,000 registered green projects nationwide by the end of 2007. This is a 10-fold increase compared to 2003. In the light of global warming controversies, political issues and public relations, the growth toward green, LEED-certified construction expects to be exceptionally strong into the future.

Tim Governor is a certified industrial hygienist and a certified safety professional employed by The Ohio State University where he is semi-retired and serves as the university's chemical hygiene officer. Governor served as president of the local chapters of the American Society of Safety Engineers, American Industrial Hygiene Association and the Society of Ohio Safety Engineers.

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Developing effective supervisors

By John Orr

Before you begin

Contact your human resources department to determine if your company has written procedures or training requirements for incorporating new supervisors into the workplace. If so, review the policy before beginning this session. If not, you may consider using this information to help develop one.

Introduction

If you are responsible for orienting a new supervisor to his or her new responsibilities, these tips may help you effectively perform your role.

Discussion

Employers often promote new supervisors because they are good at what they do, but doing a job well requires a very different skill set than overseeing how others do the job. Every newly minted supervisor – whether from inside or outside the company – requires training and mentoring before he or she can be expected to perform at a high level.

Why new supervisors fail

A change at the company nearly always causes the appointment of new supervisors. A new supervisor may be needed if your company is experiencing growth or as a replacement for a previous employee. A new supervisor can benefit from an extended mentoring period or learning from a long-time incumbent. However, this rarely occurs. Most employers thrust new supervisors into the job without adequate training.

Employees must help the new person make a successful transition. If the new supervisor is a friend or co-worker, it is tempting to try to maintain the same relationships as before. Good supervisors want to maintain positive relationships with their workers, but they also realize the job they have to do may require a change of direction to get the job done or to keep you safe. New supervisors may need to communicate this to their employees.

People skills, human relations

Some say people can only learn such skills through hard-won experience. To some extent, that may be true, but you can avoid many problems simply by doing your homework. For example, if a new supervisor has not learned how to record time sheets, he or she may shorten the paychecks of their employees. This can create credibility problems from the start.

A newly assigned supervisor must know the company's employment rules and policies, and how to administer and explain them. Make sure you give each new supervisor time to learn your company's rules and requirements.

A new supervisor must also know his or her roles and responsibilities. Supervisors must be able to explain both what is needed and why. Novice supervisors may have trouble explaining why things are done the way they are. If your company has a procedures manual, give it to the new supervisor early on, and set aside time to answer questions after he or she has had time to read it.

You may want to test the new supervisor's understanding by asking these questions.

- Can you explain your company's policies on vacations, time off and doctor visits?
- Are supervisors required to handle workers' compensation issues such as the employer's first report of injury report?

Group action

Ask the group members:

- What are your organization's rules for clocking in, time off, calling in sick, physician visits, etc.?
- How does an employee report an injury?
- What are the procedures?

If the group does not know the answers or the answers are incorrect, take the time to explain. By knowing the rules, employees can help new supervisors get through the red tape.

Technical job skills

You may have selected your new supervisor because he or she is efficient and performed well at his or her previous job. Besides knowing how to do the job right, your supervisors need to know how to recognize when an employee is doing a job incorrectly. Your supervisors need to know that you hold them responsible for ensuring their workers properly use the equipment and tools on their jobs.

Group action

If your company has job-site safety rules, ask the group members:

- What are they and which are applicable to their specific job.
- Ask the group if there are identified hazards within the workplace. What are they?
- If appropriate, ask the group to describe when and where personal protective equipment (PPE) is required within their area.

OSHA

A key element in your supervisor orientation is to make sure your supervisors know how health and safety regulations affect your company. This means they are responsible for ensuring each of their employees properly uses required PPE each time it is required. Use of safety equipment is non-negotiable.

Your supervisors must enforce your policies and company rules. You also need to ensure that your new supervisors are knowledgeable in the hazards associated with the tasks their crews will be performing.

John Orr is a certified safety professional and a regional risk management supervisor for Erie Insurance Group.

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Train the Trainer

Measuring Safety Performance

BWC's Web site (ohiobwc.com)

Industry Safety Manual

Construction Safety Manual

Safety Works –Various topics by industry/occupation.

OSHA's Web site (www.osha.gov)

- Safety and Health Program Assessment Sheet: <http://www.osha.gov/SLTC/etools/safetyhealth/form33iv.html>
- Safety and Health Management e-tool: http://www.osha.gov/SLTC/etools/safetyhealth/form33i_rachelle.html
- Sample Safety and Health programs for small business: http://www.osha.gov/SLTC/etools/safetyhealth/mod2_sample_sh_program.html
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The colors of safety

By Arne Larson

Before you begin

Look around your facility and obtain (or take pictures of) various safety signs or placards, which show the safety colors and markings your company uses. You may also wish to include some common colors or markings from other facilities or public places. Display the items you collect, and use them for reference as you progress through this lesson.

Introduction

Colors and markings communicate important safety information to workers both on and off the job. Most people encounter and recognize some safety cues every day from colors and markings they see routinely (traffic signals). Unfortunately, we observe some colors or markings so often that they just seem to become part of the background clutter.

We need to periodically reinforce the meaning and importance of colors and markings, and discuss how they can help protect people from harm. This safety talk's purpose is to provide your employees with that information and stimulate discussion about the use of colors and markings at your facility.

Common safety colors

The American National Standards Institute established rules, which define how you should use colors to communicate information. This standardization helps you easily recognize and understand what message a color is communicating. Examples are:

- Red
 - Fire protection equipment
 - Danger, high risk of severe injury or death
 - Emergency stops and alarms
- Orange
 - Hazard warnings
 - Moderate risk of injury
 - Guarding devices
- Blue
 - Notice of information
 - No immediate hazard
- Green
 - Safety equipment or information
 - First aid equipment or location
- Yellow
 - Caution statements
 - Minor risk of injury
 - Material-handling equipment

Vehicle or container placards

Trucks, rail cars and other containers must have placards attached in clear view to communicate any hazards of the contents. Some of the placards may also use symbols with the colors to convey the proper message. Discuss which of these placards you may find at your facility or on vehicles delivering hazardous materials.

1. Red - Combustible or flammable
2. Yellow - Oxidizers
3. White - Poison or toxic
4. Orange - Explosives
5. Green - Non - flammable gas
6. Red and white stripe - Flammable solid

Special color and stripe combinations identify hazards such as corrosives, reactive materials or biohazards. You may choose to show examples of these items if they are present at your facility. For more information, check with your safety department.

Other safety colors and markings

There are numerous other ways you can use colors and markings to communicate safety information. Ask participants to give examples and record responses on a flip chart to stimulate discussion. Possible ideas include:

1. Color-coded paint on piping and equipment to identify contents or use;
2. Striped or painted floors, roadways or parking lots to mark personnel and vehicle-traffic pathways;
3. Barricade tape to restrict entrance or divert traffic;
4. Reflective markers to improve night-time visibility of hazards;
5. Hazard information labels.

Group actions

Have participants take the quiz below, then review and discuss the correct answers. Based on the information presented here, ask them to observe how your facility uses color and report any changes or additions that may be needed to improve safety.

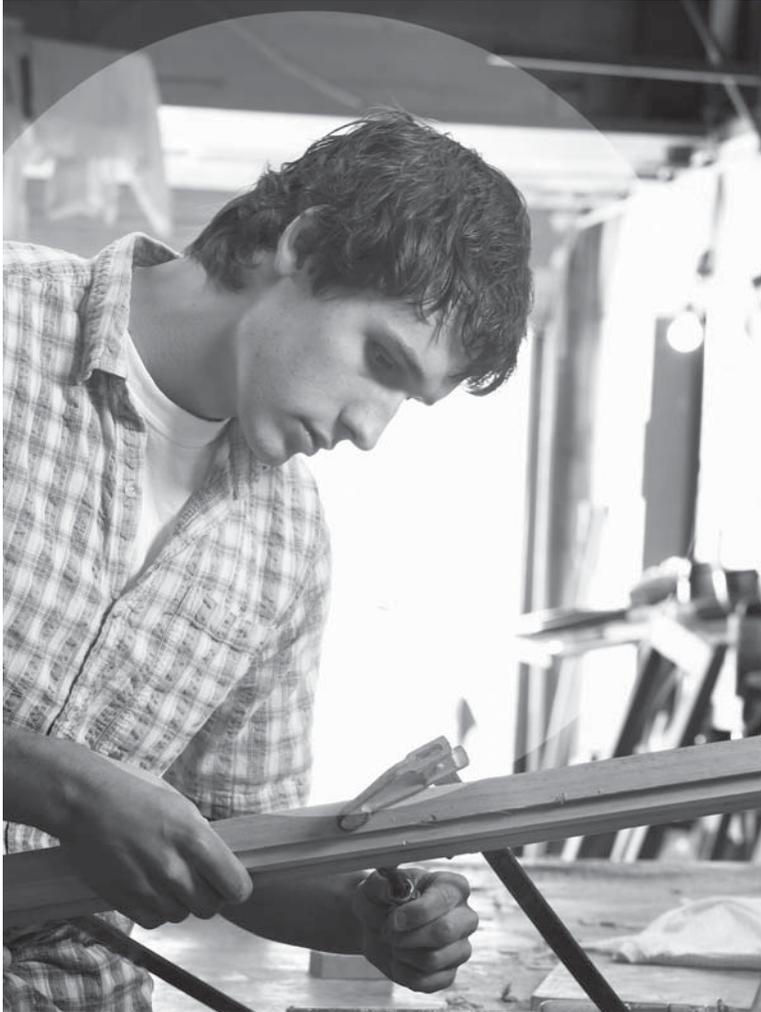
Quiz (Circle T for true or F for false.)

1. A blue sign indicates danger ahead. T or F
2. Only trucks carrying fuel need placards. T or F
3. Fire-protection equipment should be painted red. T or F
4. Safety equipment is usually painted green. T or F
5. Caution signs are normally purple. T or F
6. The NFPA diamond color yellow indicates reactivity. T or F

Answers: 1.F; 2.F, 3.T; 4.T, 5. F; 6.T.

Arne Larson is a safety specialist with the Lubrizol Corp.'s research and testing facility in Wickliffe. He has 17 years of experience in safety and industrial hygiene.

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Basic ergonomics training

By Mike Lampl

Before you begin

Observe your work areas and write down your observations. Pay attention to:

- Homemade adaptations to accommodate personal preferences and needs;
- Job tasks that require forceful exertions (i.e., heavy lifting, pushing and pulling);
- Job tasks that require awkward postures (i.e., bent wrists, bent backs, etc.);
- Job tasks that require repetitive motions (i.e., working at a fast pace);
- Information on injuries that may relate to ergonomic conditions.

Introduction

During this session you will discuss:

- What is ergonomics?
- What are cumulative trauma disorders (CTDs)?
- What are workplace risk factors that contribute to CTDs?
- How can you reduce these risk factors?
- What else can reduce CTDs?

Start the discussion by asking “What is ergonomics?” Ask the group each corresponding question and listen for the members’ input. Discuss the answers below and consider giving the group a copy of the questions and answers.

What is ergonomics?

Ergonomics is applying engineering and scientific principles when designing a work environment that accommodates the employee in relation to the workplace, product, equipment, tools, workspace and organization of the work. Ergonomics’ objective is to fit the task to the worker, rather than force the person to adapt to the work environment.

Ergonomics is essentially making jobs user friendly. Benefits include:

- Fewer injuries and CTDs;
- Improved productivity;
- Better performance and quality.

What are CTDs?

Cumulative trauma refers to wear and tear on the musculoskeletal system. Common CTDs include carpal tunnel syndrome, tendonitis and lower back disorders.

Symptoms associated with CTDs, or sometimes may lead to CTDs, include pain, swelling, inflammation, burning and stiffness.

Ergonomics is not an overnight proposition. It is a continuous improvement process, which minimizes or eliminates workplace risk factors.

Workplace risk factors are:

- Forceful exertions;
- Repetitive motions;
- Awkward postures;
- Mechanical pressure on soft tissue;
- Inadequate rest.

Just because one or more of these risk factors are present in a job does not necessarily mean a CTD will develop. However, especially with exposure to multiple risk factors, the potential for CTD is higher. Conversely, if you eliminate any or all of these risk factors, the potential for overexertion or injury decreases. The next section will illustrate ways to minimize or eliminate these risk factors.

How do you reduce workplace risk factors?

- Reduce forceful exertions.
 - Reduce manual loading by using conveyors, hoists and other mechanical means.
- Use carts, hand-trucks or powered equipment when moving materials.
- Minimize the weight of tools.
- Use vices and clamps to hold materials.
- Learn from each other how to best use tools safely and efficiently.
- Maintain neutral postures as much as possible.
 - Maintain the s-curve in your back. This can be achieved by tilting containers and using seats with good lumbar support.
- Maintain straight wrists. Use tools with proper thickness, length and shape.
- Maintain a straight neck. Adjust working heights or tilt the equipment.
- Work at approximately elbow height — slightly below for heavier work and slightly above for precision work.
- When lifting, lift between your knee and shoulder height and carry at about your waist height.
- Minimize reaching. Locate frequently used items as close to you as possible.
- Reduce the mechanical pressure on your soft tissues.
 - Pad tools.
 - Use cushioned chairs.
 - Use floor mats.

What else can reduce CTDs?

Other important points to consider for reducing CTDs and/or the severity of CTDs include:

- Reduce repetition or duration when possible. Job rotation can help;
- Understand what is adjustable at your workstation;
- Report work-related pain and discomfort, and get a medical evaluation when necessary;
- Be willing to try new work methods and tools;
- Give suggestions for ergonomic job improvements;
- Exercise and maintain a healthy lifestyle;
- Use good ergonomic principles at home as well as work;
- Keep your work area organized and the floor clean.

Group actions

Conclude by asking each member what is one key point he or she can apply from today's discussion. If the discussion leads to making physical changes, such as raising or lowering a work height, be sure to document the discussion and follow-up appropriately.

Mike Lampl is a certified ergonomics professional and BWC's Division of Safety & Hygiene acting ergonomics technical advisor. He has 15 years of safety and health experience in private industry and at BWC. Mike also is a member of the planning committee for the Applied Ergonomics Conference sponsored by the Institute of Industrial Engineers.

References

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Cold stress

By Andrew M. Pawuk

Before you begin

Ask employees to describe cold work conditions that may exist at their workplaces.

Typical answers may include working:

- Outdoors during the winter;
- On roofs;
- In open or unheated cabs;
- In refrigerated rooms, vessels or containers.

Introduction

Cold stress or hypothermia can affect workers not protected against it. When the body cannot maintain its warmth, serious cold-related illnesses and injuries can occur. This may lead to permanent tissue damage or even death.

It is natural for your body to try to maintain its core temperature (chest and abdomen) of approximately 97.6° F (37° C) by reducing heat loss and increasing heat production. To accomplish this, blood vessels on the skin, arms and legs constrict, which decreases the blood flow to your extremities. This minimizes the blood from cooling and keeps the inner organs warm. Reducing the blood flow to the skin, however, results in a lower skin temperature and increases the risk of frostbite.

Another factor that contributes to cold stress is wind chill — the combined factor of wind speed and air temperature on exposed skin. Extreme wind chill can cause flesh to freeze.

Hypothermia

Hypothermia, which means low heat, can occur when the body loses more heat than it can replace by constricting blood vessels. The body attempts to increase heat production by shivering, which begins when the body temperature falls to 95°F (35°C). Hypothermia can occur in below freezing temperatures, but it can also happen when temperatures are above freezing and a strong wind produces a dangerous wind chill.

Hypothermia can progress from mild to moderate to severe. Symptoms for each level include:

- Mild – shivering, stomping of feet, poor coordination, blue lips and fingers;
- Moderate – mental impairment, confusion, poor decision making, disorientation, inability to take precautions from the cold, heart and breathing slows;
- Severe – This stage may resemble death, unconsciousness, and the heart slows down. (The pulse may be irregular or difficult to find.) No shivering or no detectable breathing.

First-aid steps

First-aid measures should stop further body cooling. Move the victim to a warm area, remove any wet clothing and help the person stay active. With moderate symptoms, call for medical assistance and cover the person's extremities. With severe symptoms, call 911 for medical treatment and transport the victim to a medical facility. Treat the victim very gently. Do not attempt to re-warm him or her since this is best done in a hospital setting.

Frostbite

Exposing skin to severe cold causes frostbite. When tissue freezes, blood vessels become damaged and the reduced blood flow may cause gangrene. Frostbite often occurs on the face, ears, fingers and toes. The skin will look waxy and feel numb. When the skin becomes hard, frostbite is a medical emergency.

First-aid measures for frostbite include slowly warming the affected area and avoiding rubbing this area. If the tissue freezes, seek medical treatment before thawing the skin. Seek medical follow-up care for all frostbite conditions. You should not warm or thaw the frostbitten area if there is risk of the area refreezing because the damage will be worse if that occurs.

In addition to hypothermia and frostbite, exposure to cold temperatures may increase your risk factors for other health-related conditions, such as heart disease, asthma/bronchitis, diabetes and white finger syndrome.

Cold-stress controls

Be prepared for cold temperatures and be alert for any signs of cold stress. Employees must recognize the early stages of cold stress in themselves and others. The first warning sign may be pain in the extremities. The onset of shivering should warn you that you need to come out of the cold.

Workers in cold conditions should:

- Be medically fit for the cold exposure;
- Eat a balanced diet that includes increased carbohydrates to burn more fuel and increase your body heat. Carbohydrates burn faster than protein and give you quicker energy;
- Understand the risk imposed by the chill factor and be prepared for the conditions;
- Avoid caffeinated or alcoholic drinks that increase water loss and blood flow to the extremities;
- Have a back-up plan when working in isolated areas or use a buddy system to keep an eye on each other and watch for signs of cold stress.

Clothing should be suited for the cold and your level of physical activity. Here are tips to remember when working in the cold.

- Wear several levels of clothing to capture insulating air between the layers;
- To allow for ventilation, wear cotton or synthetic layers next to the skin;
- Wear waterproof or water-repellant outer clothing when working in wet conditions;
- To prevent hypothermia, remove any wet clothing.
- Protect your head from heat loss. When you do not cover your head, you can lose 40 percent of your body heat. Use hats, hoods or hard-hat liners;
- In case your work clothes become wet, keep a change of clothing available.

Conclusion

Cold environmental conditions can affect your body. Be aware of the signs or symptoms caused by hypothermia or frostbite and take appropriate action to correct the situation. If you take action quickly, the affects of cold stress may be controlled and lessened.

Quiz (Circle T for true or F for false.)

1. The body naturally tries to maintain its core body temperature. T or F
2. Wind chill has no affect on body temperature. T or F
3. Frostbite occurs when the skin freezes. T or F
4. Wet clothing should be removed as quickly as possible in cold conditions. T or F
5. Employees should recognize hypothermia's signs and symptoms for themselves and their co-workers. T or F

Answers: 1-T; 2-F; 3-T; 4-T; 5-T.

Andrew M. Pawuk is the safety and security manager at Lucas Metropolitan Housing Authority in Toledo. He previously served for 18 years as the safety director for major hospitals in Toledo and Columbus; as a safety and health specialist for Columbia Gas of Ohio; and as a private consultant.

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