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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. Reference in this Newsletter to any specific commercial products, process, service, manufacturer, or company does not constitute its endorsement or recommendation by the U.S. Government or NIH.



Addressing OSHA’s Big Four Hazards

While the workplace has a variety of hazards that can cause injuries or fatalities, the Occupational Safety and Health Administration (OSHA) has identified four leading causes of fatalities in both general industry and construction.

OSHA’s Big Four hazards are:

- Falls;
- Electrocutions;
- Caught in or between; and
- Struck by.

Because of the fatal consequences that these hazards can pose, it is prudent to refresh yourself on the safety requirements related to these tasks in the workplace.

Falls

When working in areas where there is the potential for a fall, protect yourself by following the proper procedures.



OSHA requires your employer to provide fall protection at four feet in general industry, five feet in maritime, and six feet in construction.

However, regardless of the fall distance, fall protection must be provided when working over dangerous equipment and machinery.

Also, be diligent when it comes to working in personnel platforms lifted with forklifts. OSHA requires prior

approval, written by the manufacturer, before adding a platform to the forks of a forklift. If the manufacturer does not respond or responds negatively, OSHA says that your employer can rely on a safety analysis conducted by a registered professional engineer, who must do testing similar to that which the manufacturer would do.

Even in an approved platform, there must be adequate fall protection in place, whether by railings or a personal fall protection system (e.g., lanyard/harness system), as well as special precautions such as not moving employees horizontally in the basket, except for minor positioning.

Similarly, make sure you have the correct tools for the job (e.g., ladders, scaffolding, scissor lifts) and that you use and maintain this equipment properly. In addition, always be diligent with good housekeeping procedures to control slip hazards.

Electrocutions

Exposure to electrical energy can occur in a variety of ways — through contact with an object as seemingly innocuous as a broken light bulb to an



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energized overhead powerline. You must be trained in safe practices for the work the you will perform. Even trained workers need some protective equipment, depending on the type of exposures.

Most electrical accidents result from one of the following three factors:

- Unsafe equipment or installation;
- Unsafe environment; or
- Unsafe work practices.

Some ways to prevent these accidents are through the use of insulation, guarding, grounding, electrical protective devices, and safe work practices.

Make sure to be very careful if performing work near power lines and choose the appropriate ladder and other equipment.

Also, make sure equipment is in good condition, that repairs are made only by qualified personnel, and that proper lockout/tagout procedures are in place for repairs. Be extra cautious in damp locations.

Caught in or between

A caught in or between hazard occurs when an individual is caught between two or more objects, or between parts of an object — causing the individual to be squeezed, crushed, pinched, etc.

To prevent this type of hazard, make sure machine safeguards are in place; moving machine parts can pose serious danger.

All machines consist of three fundamental areas:

- The point of operation;
- The power transmission device (e.g., belts and pulleys); and
- Operating controls.

Despite all machines having the same basic components, their safeguarding needs widely differ due to varying physical characteristics and operator involvement. Make sure you are properly trained on any machine before using it.

Also, be sure to watch out for the following items that can pose serious danger because they can be caught in moving parts:

- Loose clothing;
- Jewelry; and
- Long hair.

Besides normal operation, the following activities



involving stationary machines also expose you to potential amputation hazards:

- Setup/threading/preparation for regular operation of the machine;
- Clearing jams or upset conditions;
- Making running adjustments while the machine is operating;
- Cleaning of the machine;
- Oiling or greasing of the machine or machine pans;
- Scheduled/unscheduled maintenance; and
- Locking out or tagging out.

Struck by

A struck by hazard occurs when an individual is injured by forcible contact with an object or piece of equipment. Forcible contact can happen with a items such as a vehicle or flying or falling objects.

To prevent struck-by hazards, make sure you have safe operating distances and that you are separated from machinery and equipment.

Keep material handling equipment in good working order and be sure that you are trained before operating the equipment.

Make sure you know the areas where moving equipment operates, and, when possible, avoid walking through those areas.

Use designated walking areas as much as possible. OSHA requires that permanent aisles and passageways be free from obstruction and be appropriately marked where mechanical handling equipment is used.

Employers often use the following methods to separate pedestrians from lift trucks:

- Pedestrian walkways;
- Permanent railings or other protective barriers;
- Adequate walking space at least on one side, if pedestrians must use equipment aisles; and
- Pedestrian walkway striping on the floor, if barriers cannot be used.



If available, be sure to check convex mirrors at blind aisle intersections, and watch for traffic control signs.

Additionally, be very cautious around forklift/trailer loading operations. Training is critical, along with lighting, alarms, and spotters in many cases, to prevent struck-by hazards.

Safety focus: Preventing heat illness

Staying safe at work has its challenges, especially for workers that are exposed to hot temperatures. Heat stress is caused by a number of interacting factors, including environmental conditions, clothing, and workload. Whether it's the result of seasonal fluctuations or the type of work performed, extreme temperatures can affect the body's natural ability to handle heat, which can lead to heat-related illnesses.

Risk factors

A worker's sensitivity to heat can be affected by physical factors such as age, weight, degree of physical fitness, medical conditions, and metabolism. Environmental factors also play a large role, including air temperature, humidity, radiant heat, clothing, and personal protective equipment.

Additionally, some workers might be at greater risk than others if they have not built up a tolerance to hot conditions.



What is heat illness?

The body normally cools itself by sweating. When working in a hot environment, especially with high humidity, sweating isn't enough. Body temperature can rise to dangerous levels if precautions are not taken. Heat illnesses range from heat stroke to heat cramps. Heat stroke can result in death and requires immediate medical attention.

Workers should be able to recognize the symptoms and remedies for heat illness.

Types

- **Heat stroke** is the most serious heat-related illness and is life-threatening. It occurs when the body is unable to regulate its core temperature. Symptoms include confusion, fainting, dry skin, and a very high body temperature.
- **Heat exhaustion** is the result of the body responding to the loss of water and salt from heavy sweating. Signs include, headache, dizziness, thirst, and heavy sweating.
- **Heat cramps** are the result of the loss of fluids and salts during sweating. The muscles that are used to perform the work on the ones that are usually affected because they are tired.
- **Heat rash** is caused by sweat that does not evaporate from the skin. It often appears as clusters of red bumps on the neck, chest, and in folds of skin.

Prevention

When working in high temperatures, whether it is indoors or outdoors, certain measures can be taken to help prevent heat-related illnesses.

Air temperature. One way to reduce excessive heat exposure is to increase the rate the body loses heat. Modifying air temperature and air movement across the skin can reduce the risk of a heat illness. Consider bringing outside air or air conditioning into the work area and wear one layer of work clothing when possible.

Water. Drink water frequently — about one cup every 15 to 20 minutes in moderately hot conditions; do not wait until you are thirsty.

Breaks. Rest breaks provide time for cooling and the opportunity to drink water. Ideally, the breaks should be in cooler or air conditioned area. Outdoor workers should move to a shaded area when possible.

Acclimatization. Workers need to become acclimated to the working conditions, especially if they are new to working in a hot environment or have been away from work for a week or more. Workloads should be gradually increased to allow more frequent breaks during the first week of work.

OSHA recommends that employees get used to hot environments by gradually increasing exposure over a five-day work period beginning with 50 percent of the normal workload and time spent in the hot environment, and then gradually building up to 100 percent by the fifth day. New workers and those returning from an absence of two weeks or more should have a five-day adjustment period.

Become familiar with the symptoms of heat illness and watch for any signs in yourself and others during hot weather. Plan for an emergency and know what to do — acting quickly can save lives!



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The purpose of this newsletter is to provide a forum for the dissemination of health and safety information. It is intended to enhance communication to National Institutes of Health (NIH) employees, raise awareness of current safety policies and procedures, and provide guidance on relevant issues. It is provided as a service by the NIH, Office of Research Services, Division of Occupational Health and Safety.

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Avoiding mosquito-borne illnesses

"It's not what you look at that matters, it's what you see."

Henry David Thoreau



Mosquitoes can transmit diseases such as the West Nile and Zika viruses.

On a beautiful day, protecting yourself from illness may be the farthest thing from your mind. However, if you're heading to an area that's home to mosquitoes and the diseases they carry, it's worth taking time to protect yourself.

Mosquitoes not only have an annoying bite, they can also transmit diseases such as the West Nile and Zika viruses. Because mosquitoes find humans by using receptors which can detect carbon dioxide and skin odor, it's virtually impossible to hide from them without taking preventive measures. To reduce your risk of being bitten and the potential for infection:

- Wear long-sleeved shirts, long pants, and shoes that cover your feet.
- Use an insect repellent containing DEET or picaridin on uncovered skin. Remember to spray the repellent on the outside of your clothing, as mosquitoes can bite through some clothing. Reapply the repellent as directed.
- Avoid areas with standing water, such as marshes.

West Nile, Zika cause concern in the U.S.

Two mosquito-borne diseases found in the United States are the West Nile and Zika viruses. Most individuals infected by either disease have mild symptoms and recover spontaneously. However, there is

a chance that the conditions could lead to severe health problems, and individuals experiencing symptoms should talk with a health care provider.

Zika Facts

The Zika virus is carried by a mosquito that is active both during the day and at night. Transmission of the disease via mosquito has been reported in southern Florida and Texas, as well as in other parts of the world, including Central and South America.

A person infected by the virus may experience fever, red eyes, joint pain, and a rash. A primary concern with the Zika virus is that it can cause serious birth defects. An unborn baby can become infected when the mother contracts the virus.

West Nile Facts

West Nile virus, first detected in North America in 1999, has been found throughout the lower 48 states.

While the majority of people infected with the disease show no symptoms, some people have fatigue or body aches that last for weeks or months. The disease can bring flu-like symptoms, such as fever, a headache, and body aches, as well as a rash.

A small percentage of people infected by the virus develop a serious illness involving inflammation of the brain, such as encephalitis or meningitis.