

Contents:

| | |
|-------------------------------|-----|
| Hazardous waste labeling | 1 |
| Eye safety/ protection | 2-3 |
| Sleep deprivation | 4-5 |
| Respiratory protection | 6-9 |
| Injury reporting/Workers comp | 10 |
| Chemical sharing prog. | 11 |
| Contact EHS | 11 |

Acceptable hazardous waste labeling by Peter Nagle

If you saw the chemical formula C₉H₁₃N on a label, would you know what it was? Most people would not, and even experienced chemists might not be sure either. A product search of the Sigma/Aldrich catalog using the above formula reveals 72 chemicals. Among the chemicals sharing that formula are the following:

- L-Amphetamine- a schedule II drug
- 2,4,5- Trimethylaniline- a suspected carcinogen
- N,N-Dimethylbenzylamine- a highly corrosive liquid

As you can see, a chemical formula is not always unique to one chemical. For this reason chemical formulas should never be used on labels for hazardous waste or chemical products in the laboratory.

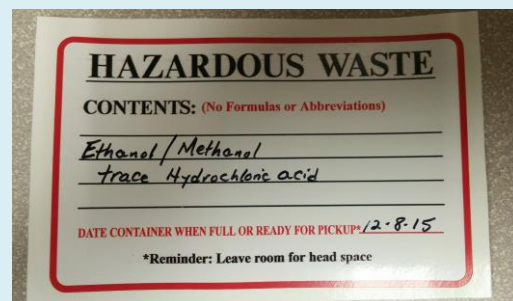
Even if a chemical formula is unique to a specific chemical such as hydrochloric acid (HCL) or sodium hydroxide (NaOH), it should not be used because many emergency responders are not familiar with chemical formulas; however they are capable of looking up chemical names in an emergency reference guide. The main goal of chemical labeling in the laboratory is not for your identification only, but to convey constituents and their hazards to emergency responders, co-workers, and other interested parties.

Abbreviation is another practice frequently used on container labels in laboratories. While it is not allowed on hazardous waste labels there is some flexibility with the labeling of chemical products in secondary containers (containers other than the manufacturer's original container that the chemical was shipped in). OSHA's Laboratory Standard does not specifically deal with the labeling of secondary containers. Rather, it allows laboratories to develop their own labeling system within their Chemical Hygiene Plan as long as it effectively communicates chemical constituents and their hazards to its employees.

UNE's Chemical Hygiene Plan states that all containers must be labeled or coded in all cases. If codes or markings are used other than chemical names, a code key or legend must be readily available in the workplace where it can be found easily by emergency responders.

The following abbreviations are frequently used in laboratories at UNE:

- ETOH- ethanol
- MEOH- methanol
- ACN- acetonitrile
- PBS- phosphate-buffered saline
- EDTA- ethylenediaminetetraacetic acid

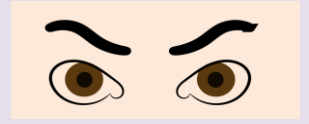


This is permissible as long as there is a code key readily available for any emergency responders or other interested parties to reference quickly and easily.

Again the goal of labeling is not for your identification only, but also for those who may need this information in an emergency situation and are not familiar with the numerous abbreviations often used in our labeling system.



Safety Spotlight



The December 2015/January 2016 Safety Spotlight is on: Eye Safety

Question: How many work-related eye injuries are there each day?

Answer: About 2,000 eye injuries occur every day at work in the U.S.A. Construction workers have one of the highest eye injury rates from particles of dust, metal, wood, slag, drywall, cement, etc. Even “minor” eye injuries can cause life-long vision problems and suffering. A simple scratch from sawdust, cement, or drywall can cause corneal erosion that is recurrently painful. Chemical and biological splashes in labs can also damage eyesight temporarily or permanently.

Question: What are the eye hazards in the labs?

Answer: Chemical splashes (corrosives, flammables, solid powders), biological and blood borne pathogens splashes from animal or human bodily fluids, shards of glass from accidental dropping of glassware, bone splinters and scalpel head breakages (anatomy lab).

Question: How can you reduce the eye hazards in your lab?

Answer: 3-Part Eye Safety Strategy

- 1) BEST: Use engineering controls such as working in fume hoods, using scalpel head removal devices, etc.
- 2) GOOD: Use administrative controls such as making certain areas “off limits” while hazardous work is being performed.
- 3) REQUIRED, but doesn't remove all risk: Use the proper protective eyewear.

Question: Do workers in your lab wear proper eye protection when needed? How many workers in your lab wear any eye protection at any time? Are they wearing the correct or proper eye protection?

Answer: The most common answer given by workers with eye injuries when asked “why weren't you wearing safety glasses?” is “I didn't think that I needed it!” Eye protection should always be worn when working in a laboratory setting.

Question: What is safety eye and face protection?

Answer: Safety eye and face protection includes non-prescription and prescription safety glasses, clear or tinted goggles, face shields, welding helmets, and some full-face type respirators that meet the ANSI Z87.1. The safety eyewear must have “Z87” or “Z87+” marked on the frame and in some cases the lens.

Question: When are you required to have “side protection” or “side shields” on your safety glasses?

Answer: Side protection is required any time that there are hazards from splashes, flying particles or flying objects. Many eye injuries have occurred because there was not adequate side protection, proper fit, or particles fell from above.

Question: When should you wear goggles vs. safety glasses?

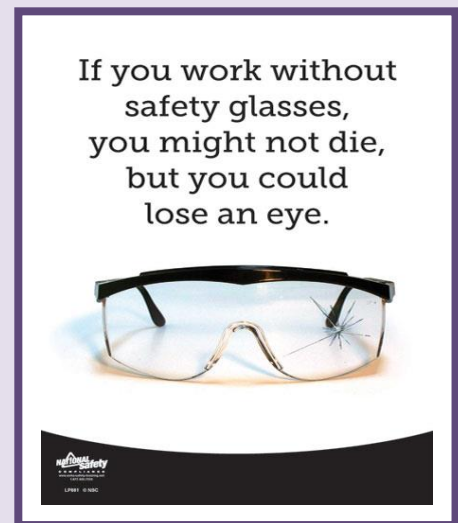
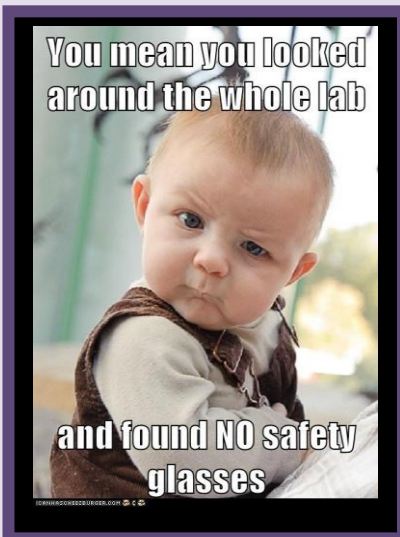
Answer: Goggles are stronger than safety glasses. Goggles are used for higher impact protection, greater particle protection, chemical splashes, and welding light protection. Goggles for splash or high dust protection should have indirect venting. Goggles with direct venting (a mesh of small holes around the sides) tend to fog less, but should not be used with liquid or fine dust hazards.

Question: When should you use a face shield?

Answer: Face shields are used for even higher impact protection and to protect the wearer's face in addition to the eyes. Face shields should always be used over safety glasses or goggles. Particles or chemicals can easily go around a face shield and the curve of the face shield can direct them into the eye. Face shields are frequently lifted leaving the eyes unprotected without the safety glasses or goggles.

Check the fit of your safety glasses.

- 1) Where are the biggest gaps? Do the glasses fit snugly against the face or slide down your nose? The biggest gaps are usually near the corners of the glasses. The bigger the gap the more exposure to hazards coming from a slight angle from above or below. Glasses that are not snug against the face create larger gaps in protection.
- 2) Some safety glasses are made in different sizes to fit differently shaped faces. Different styles also may fit one person better than another. Adjustable temples and eyewear retainers or straps help hold the glasses in the proper position close to the face.
- 3) Are your safety glasses comfortable? Do your safety glasses look cool? Safety glasses have hard or soft nose pieces, padded temples, and a variety of other features that improve comfort without adding great cost. Safety glasses come in many styles from the Buddy Holly heavy frames, to the old visitor specs, frameless lens, frames with football logos, aviator metal frames, and the most stylish wraparound glasses.
- 4) What are the lenses made of in your safety glasses? Most non-prescription (plano) safety glasses have polycarbonate lenses. The non-prescription safety glasses are tested by shooting a 1/4" BB at 100mph at the lens and dropping a 1 lb. pointed weight from 4' on the lens. If it breaks in either test it won't have the Z87 mark. Prescription safety glasses may have polycarbonate, glass, or a plastic called CR39, but these glasses only have to pass a test of dropping a 2 oz steel ball from 4', unless they are marked Z87+; then they must pass the high velocity/impact tests. Polycarbonate lenses are much more impact resistant than glass or plastic lenses. Glass and plastic lenses usually shatter into small sharp pieces, but polycarbonate usually just cracks.
- 5) Keep glasses free of scratches, dust, and dirt. Clean glasses with a damp cloth or a dry soft cloth on a regular basis. If glasses are scratched and impairing your vision, a new pair of glasses should be purchased.



Source: <http://www.cdc.gov/niosh/topics/eye/toolbox-eye.html>

Is sleep effecting your job performance?

By Jessica Tyre

Lack of sleep can have many detrimental effects on adults including decreased productivity at work. A 2011 study through Harvard Medical School estimated that lack of sleep costs employers up to \$63 billion a year due to lower productivity, accidents caused by sleep deprivation, and the number of sick days attributed to symptoms that occur with a lack of sleep. Adults need anywhere from 7.5 to 9 hours of sleep a night to reach their peak performance during the day. There is a big difference between the amount of sleep you can get by on to function and the amount of sleep that optimizes your performance and health. You may be sleep deprived if: you need an alarm clock to get up on time, rely on the snooze button, have a really hard time getting out of bed in the morning, feel sluggish in the afternoon, get sleepy in lectures, meetings, or warm rooms, need a nap to get through the day, fall asleep while watching TV, feel the need to sleep in on weekends, or fall asleep within five minutes of going to bed. If you are not sleeping enough, the effects can impact every aspect of your life and health. Get some rest to do your best!

Some of the negative effects of sleep deprivation include:

- Fatigue, lethargy, lack of motivation
- Moodiness, irritability, and lack of emotional control
- Reduced creativity and problem solving skills
- Inability to cope with stress
- Reduced immunity, leading to more colds and infections
- Concentration, information retention, and memory issues
- Weight gain and obesity
- Impaired motor skills and reaction time (causing accidents)
- Difficulty making decisions
- Increased risk of diabetes, heart disease, and other medical conditions



If you are sleep deprived at work, there are a few things you can do to optimize your performance:

- Expose yourself to bright light
- Schedule meetings when you are most alert
- Use caffeine in moderation
- When possible, take a short power nap (before 5:00pm)
- Do not perform work tasks where your safety or a co-workers safety may be compromised
- Stay active by stretching and taking short walks if you are working at a desk or lab bench frequently



Continued on page 5...

MYTHS ABOUT SLEEP:

Myth 1: Getting just one hour less sleep per night won't affect your daytime functioning. You may not be noticeably sleepy during the day, but losing even one hour of sleep can affect your ability to think properly and respond quickly. It also compromises your cardiovascular health, energy balance, and ability to fight infections.

Myth 2: Your body adjusts quickly to different sleep schedules. Most people can reset their biological clock, but only by appropriately timed cues—and even then, by one or two hours per day at best. Consequently, it can take more than a week to adjust after traveling across several time zones or switching to the night shift.

Myth 3: Extra sleep at night can cure you of problems with excessive daytime fatigue. The quantity of sleep you get is important, sure, but it's the *quality* of your sleep that you really have to pay attention to. Some people sleep eight or nine hours a night but don't feel well rested when they wake up because the quality of their sleep is poor.

Myth 4: You can make up for lost sleep during the week by sleeping more on the weekends. Although this sleeping pattern will help relieve part of a sleep debt, it will not completely make up for the lack of sleep. Furthermore, sleeping later on the weekends can affect your sleep-wake cycle so that it is much harder to go to sleep at the right time on Sunday nights and get up early on Monday mornings.

Adapted from: *Your Guide to Healthy Sleep (PDF)* The National Institutes of Health



Average Sleep Needs by Age

| | |
|-------------------------|--------------|
| Newborn to 2 months old | 12 - 18 hrs |
| 3 months to 1 year old | 14 - 15 hrs |
| 1 to 3 years old | 12 - 14 hrs |
| 3 to 5 years old | 11 - 13 hrs |
| 5 to 12 years old | 10 - 11 hrs |
| 12 to 18 years old | 8.5 - 10 hrs |
| Adults (18+) | 7.5 - 9 hrs |

General Respiratory Protection Guidance and Questions for Employees

by Ronnie Souza

This guidance provides information on what respirators are, how they work, and what is needed for a respirator to provide protection.

What is a respirator?

A respirator is a device that protects you from inhaling dangerous substances, such as chemicals and infectious particles. Respirators are among the most important pieces of protective equipment for working in hazardous environments. Selecting the right respirator requires an assessment of all the workplace operations, processes or environments that may create a respiratory hazard. The identity of the hazard and its airborne concentrations need to be determined before choosing a respirator. This assessment should be done by experienced safety personnel or by an industrial hygienist. There are several different types of respirators, as described below.

How do respirators work?

Respirators work by either filtering particles from the air, chemically cleaning (purifying) the air, or supplying clean air from an outside source.

Particulate respirators: Particulate respirators are the simplest, least expensive, and least protective of the respirator types available. These respirators only protect against particles (e.g., dust). They do not protect against chemicals, gases, or vapors, and are intended only for low hazard levels.

The commonly known “N-95” filtering facepiece respirator or “dust mask” is one type of particulate respirator, often used in hospitals to protect against infectious agents. Particulate respirators are “air purifying respirators” because they clean particles out of the air as you breathe.

Particulate respirators:

- Filter out dusts, fumes and mists
- Usually disposable dust masks or respirators with disposable filters
- Must be replaced when they become discolored, damaged, or clogged
- Examples: filtering facepiece or elastomeric respirator



Chemical cartridge/Gas mask respirator:

Gas masks are also known as “air-purifying respirators” because they filter or clean chemical gases out of the air as you breathe. This respirator includes a facepiece or mask, and a cartridge or canister. Straps secure the facepiece to the head. The cartridge may also have a filter to remove particles.

Gas masks are effective only if used with the correct cartridge or filter (these terms are often used interchangeably) for a particular biological or chemical substance. Selecting the proper filter can be a complicated process. There are cartridges available that protect against more than one hazard, but there is no “all-in-one” cartridge that protects against all substances. It is important to know what hazards you will face in order to be certain you are choosing the right filters/cartridges.

Chemical cartridge/Gas mask respirator:

- Uses replaceable chemical cartridges or canisters to remove the contaminant
- Are color-coded to help you select the right one
- May require more than one cartridge to protect against multiple hazards

Respiratory protection continued...

Powered Air-Purifying Respirator (PAPR): Powered air-purifying respirators use a fan to draw air through the filter to the user. They are easier to breathe through; however, they need a fully charged battery to work properly. They use the same type of filters/cartridges as other air-purifying respirators. It is important to know what the hazard is, and how much of it is in the air, to select the proper filters/cartridges.

Self-Contained Breathing Apparatus (SCBA): is the respirator commonly used by firefighters. These use their own air tank to supply clean air, so you don't need to worry about filters. They also protect against higher concentrations of dangerous chemicals. However, they are very heavy (30 pounds or more), and require very special training on how to use and maintain them. The air tanks typically last an hour or less depending upon their rating and your breathing rate (how hard you are breathing). Self-Contained Breathing Apparatus can provide clean air from a portable air tank when the air around you is simply too dangerous to breathe.

**All of these respirators (except for the “dust masks” or filtering face pieces) are available in either half-mask or full-face pieces.

What are respirators made from?

Filtering facepiece (dust masks) are generally made directly from a cloth-like filter material. Chemical cartridge/gas mask respirators can be made from a variety of materials. The most popular facepiece materials are silicone, neoprene, and rubber. In general, rubber and neoprene are rigid, durable materials. Silicone is usually preferred for its comfort, flexibility and ease of cleaning. Full-face respirators are available with strap harnesses or ratchet suspensions. The harness type can be worn under a hard hat, but ratchet suspensions are generally easier to adjust, making donning and doffing easier.

Are there any cautions or limitations when using respirators?

Yes. Each type of respirator can come in several varieties, each with its own set of cautions, limitations, and restrictions of use. Tight fitting respirators require fit testing to ensure an adequate fit to the face, and cannot be used with facial hair. Certain escape respirators use a nose clip and mouthpiece, which is clenched between your teeth, similar to a snorkel. Some respirators prevent the user from talking while others have speaking diaphragms or electronic communication devices. Every respirator contaminated with hazardous chemicals should be cleaned and decontaminated or disposed of properly. All respirators require training in order to be properly used. Sometimes you can practice using your own respirator. Some escape respirators come in a package that must remain sealed until use, so you need to be trained using a special “practice” version. Training is extremely important in regard to the storage, maintenance, use, and disposal of the respirator. This information is provided by the supplier of the respirator (i.e., seller, distributor, or manufacturer). If you do not use a respirator correctly, it is very likely that it will not adequately protect you and may even hurt you.

How well does a respirator need to fit me?

If your mask does not make a tight seal all the way around your face when you inhale, you may breathe contaminated air that leaks around the edges of the face seal. Most respirators come in different styles and sizes, and fit different people differently because peoples' faces have different shapes. You also need training to know how to correctly put the mask on and wear it properly. This information should be provided by the supplier of the respirator. The only way to tell if a tight-fitting respirator fits you properly, and is capable of protecting you, is to fit test the respirator. Fit testing can be accomplished a number of different ways and should be done by a health and safety professional before workers wear a respirator in a hazardous environment. Respirators must be checked for proper fit each time they are donned to ensure they provide adequate protection.

Respiratory protection continued...

Can I wear a respirator if I have a beard? Anything that prevents the face mask from fitting tightly against your face, such as a beard or long sideburns, may cause leakage. If your respirator requires a tight fit, you must trim back your beard so that it will not interfere with the face-facepiece seal. If your respirator is a loose-fitting (hooded) positive pressure respirator (e.g., a powered air-purifying respirator, PAPR) then you may have a beard.

If I have the right cartridges/filters for a certain hazard, and my mask fits, will they always protect me against that hazard?

No. Gas masks and respirators reduce exposure to the hazard, but if the exposure is such that it goes beyond what the filter is capable of handling (either because the amount of toxic gas or particles is more than what the filter is designed to handle, or because the exposure lasts longer than what the filter is designed to handle), the filter may not be effective in providing required protection. Also, there may be a small amount of leakage even if the fit of the respirator has been tested. If so, and if there is a large amount of a toxic chemical in the outside air, even that small leakage can be dangerous.

Can anyone wear a respirator?

No. Breathing through a respirator is more difficult than breathing in open air. People with lung diseases, such as asthma or emphysema, elderly people, and others may have trouble breathing. People with claustrophobia may not be able to wear a full facepiece or hooded respirator. People with vision problems may have trouble seeing while wearing a mask or hood (there are special masks for people who need glasses). Employees must be medically evaluated before being assigned to use a respirator.

Will my cartridge/filter and respirator mask protect forever?

No. Cartridges, filters, and masks get old. If the filter cartridges are outdated, have been open to the air or are damaged, you may not be protected. Cartridges that contain charcoal or other chemicals for filtering the air should be kept in air-tight packages until use. If cartridges are open or not packed in air-tight packaging, they should not be used. Even cartridges in original packaging have expiration dates that should be checked before purchase and use. Also, over time your mask can get old and break down. Keep your mask in a clean, dry place, away from extreme heat or cold. Inspect it before and after use according to the manufacturer's instructions. Cartridges also have a limited service life; they must be changed periodically during use.

Will a gas mask protect me if there is not enough oxygen in the air?

No. Air-purifying respirators do not provide oxygen. If used in an environment with low oxygen levels, such as in a fire or a confined space, you are in danger of asphyxiation.

Will a gas mask protect me if there is a fire? Most will not. It's important to read the manufacturer's information if your main concern is to be able to escape from a smoke-filled building. Smoke particles can rapidly clog gas mask filters, and filters with special chemicals are needed to protect against carbon monoxide and other gases that may occur in a fire. Not all gas masks or escape respirators protect against these hazards. Some components, including hoods and facepieces, of many of the gas masks and escape respirators may melt if exposed to a fire.

Once I put on my gas mask, how long will it last?

That depends on how much filtering capacity the respirator has and the amount of hazard in the air – the more chemical or biological hazard in the air (higher concentration), the shorter the time your filter will last. There is no absolute time limit, and it will vary by each respirator model's capacities and the concentration of the hazard.

Respiratory protection continued...

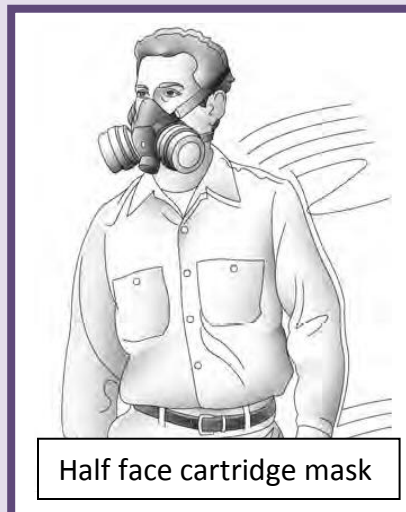
QUESTIONS TO CONSIDER REGARDING ANY RESPIRATOR YOU ARE CONSIDERING WEARING:

1. What protection (which chemicals and particles, and at what levels) does the respirator provide?
2. Is there more than one size?
3. Which size should I use?
4. How do I know if the gas mask or respirator will fit?
5. What type of training do I need?
6. Are there any special maintenance or storage conditions?
7. Will I be able to talk while wearing the respirator?
8. Does the hood restrict vision or head movement in any way?
9. Can I carry the device in the trunk of my automobile?
10. Is a training respirator available?

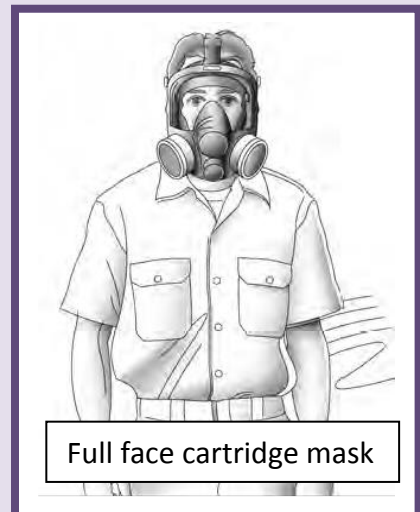
Submitted to EHS Lab Chatter by: Ronnie Souza via the OSHA Safety Bulletin



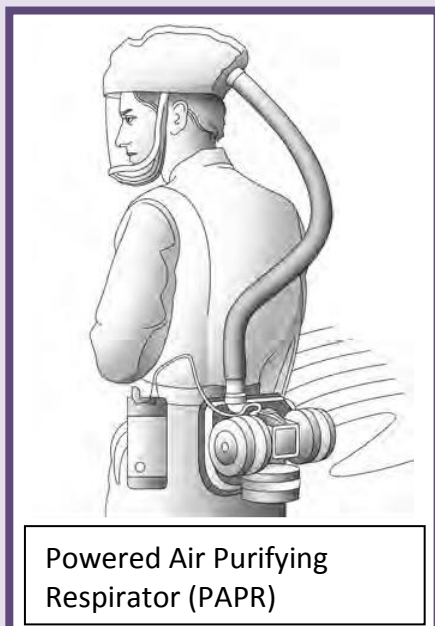
Dust Mask



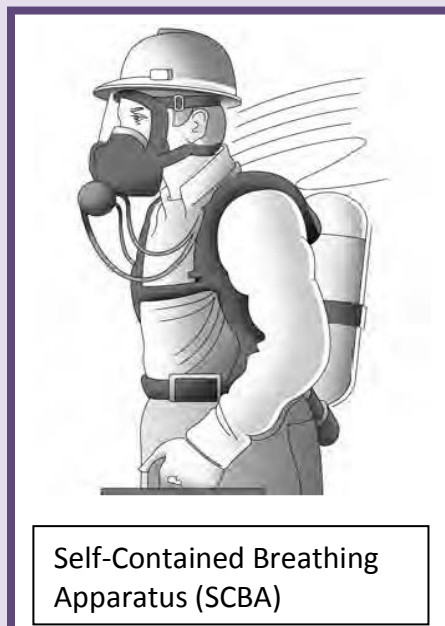
Half face cartridge mask



Full face cartridge mask



Powered Air Purifying
Respirator (PAPR)



Self-Contained Breathing
Apparatus (SCBA)

Respirator Types

Report, Report, Report...

By Cat Martins, Benefits Administration Coordinator, Human Resources

If you suffer an injury while working, one of the most important things you can do is report it. Even if the injury does not appear to require immediate medical attention, UNE asks for all injuries to be reported immediately to either a supervisor, Safety & Security, or Human Resources. Accident reports to document your injury can be located on UNE's Human Resources website at <https://www.une.edu/hr/support/employee-support>. For more information regarding the Accident Reporting process, please contact Cat Martins in Human Resources at cmartins@une.edu or 207-602-2394.

Sometimes injuries can seem minor at the time of incident, but over time they can grow into bigger problems. Sometimes it is not clear whether an injury is work-related or not. UNE asks for all injuries to be reported immediately so we can notify workers' comp and let them make the determination. Read the four "Workers' Comp or No?" cases below and test yourself to see if you would have made the right determination.

Case 1: Daigle v. High View Manor

- Nurse Daigle worked on the 3rd floor of a facility from 3:00pm – 11:00pm;
- One night her shift ended late and the elevator was "locked out";
- As she was descending the stairs, her leg gave way and she fell;
- She twisted and injured her right knee.

Workers' Comp or No?

Case 2: "The Quesadilla"

- Host and waiter;
- Encouraged to recommend food to customers;
- Demonstrations and tastings are done at shift meetings;
- Meeting attendance is required and on paid time;
- No cost for food samples;
- Not disciplined for not sampling;
- Chicken quesadilla tasting;
- Choked on a partially chewed bite;
- No prior problems swallowing food.
- Injury: Esophageal perforation and collapsed lung

Workers' Comp or No?

Case 3: "Up In Smoke"

- Employee worked with disabled clients;
- Attended a mandatory recertification course put on by the employer at a location different than the employee's normal workplace;
- Employer paid the employee;
- 2 breaks and 1 lunch were scheduled;
- Smokers must go to a certain area of sidewalk, off premises;
- While standing on sidewalk smoking, a car jumped the curb and struck the employee.

Workers' Comp or No?

Case 4: "Show & Yell"

- Teacher in small office;
- Vice Principle entered with a snake;
- Teacher jumped out of seat;
- Started screaming;
- Ran into concrete wall;
- Injuries to her knees and heart, as well as PTSD.

Workers' Comp or No?

How did you do??

Answers: (1) Yes, (2) No, (3) Yes, (4) Yes

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Have a safe and fun winter break!



UNE Chemical Sharing Listing

The UNE Chemical Sharing Program is a great way to reduce hazardous waste, reduce costs for your department, and have a positive environmental impact on campus. If you have any commonly used lab chemicals that you are thinking of disposing, please contact EHS so they can be listed in the next issues of EHS Lab Chatter as available for the UNE Chemical Sharing Program.

Chemicals currently available: None

