ENVIRONMENTAL HEALTH AND SAFETY

Lab Chatter

UNE UNIVERSITY OF NEW ENGLAND
INNOVATION FOR A HEALTHIER PLANET

Volume 3, Issue 3, November 2016

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Come see EHS at the
Employee Benefits Fair
Nov. 1st (Biddeford)
Nov. 3rd (Portland)
and enter to win one of 28 used 19"computer monitors for your personal use!

Safety Spotlight

Lab Safety Shout Out!

We are so lucky to have such a proactive staff at UNE that is always coming up with great ideas on how to enhance lab safety! We would like to highlight a couple of those efforts in this month's EHS Lab Chatter. These are innovative and exciting ideas that some of our faculty and staff have contributed to the lab environment on their own that make a big difference in the daily operations of laboratories. A big thank you for going the extra mile and keeping everyone safe and informed!

Shout out #1: Gross Anatomy Lab

During a routine lab inspection there was a posting spotted on the wall in the Gross Anatomy Lab in the Alfond Science building that detailed what types of waste go into what receptacles. There are real photos of the receptacles on the posting with a short description of what waste goes into each one. This is a clever and effective way to make sure that all the waste is collected properly and disposed of correctly. This is super handy for both students and staff. Way to go!!

UNE EHS: Safety Culture and Beyond

By Jessica Tyre

Throughout the history of employment, Environmental Health and Safety Departments have been viewed as the "safety police". There has been this employee perception in the past that EHS is out to get them in trouble or tell them what they are doing wrong. In the present day, occupational safety has taken a different turn. It is a very employee-focused field, where the EHS professional's main goal is to protect the safety and health of the employees by doing everything in their power to be a resource, a guide, and a partner in safety. The UNE EHS department is devoted to helping and assisting all departments across both campuses to prevent workplace injuries and illnesses.

We offer services such as:

- Laboratory safety inspections
- Ergonomic work station evaluations
- Chemical selection guidance and storage recommendations
- Air quality investigations
- Noise monitoring
- Air sampling
- Chemical clean outs
- Regulatory compliance assistance
- Employee safety training
- Hazard assessments

And much more!

We are always reaching out to the UNE community to offer our support and make sure that employees are happy and healthy in their workplace. If there is anything we can do to make your job safer, please do not hesitate to reach out and ask questions or ask for help. That's what we are here for!

Safety Culture

It is important in any organization to have a strong safety culture and to look out for one another in our day to day operations. The term "safety culture" gets thrown around a lot, but what does it actually mean? Many of us can be complacent in our daily routines and it is important for us to watch out for ourselves and our co-workers when it comes to safety. We all have the same goal at the end of the day: to go home just as healthy as we came into work. Looking out for each other enhances our safety culture and unifies us as an organization. We need to be mindful of our own safety practices and how they affect us, our families, and our co-workers. Safety is everyone's responsibility. You may have heard the saying "see something, say something"; that phrase is very useful when it comes to safety. If you see someone being unsafe, you need to say something to that individual. You could prevent a serious burn, or a laceration, or an eye splash. You already have permission to say something to a co-worker if they are being unsafe…it's an unspoken permission from your co-worker's parents, their spouse, their children, their friends…to keep them safe and healthy. Having that extra sense of safety awareness and making sure we are being safe and those around us are being safe, are what safety culture is all about. Safety first makes you last!

Non-ionizing Radiation Contributed by Ronnie Souza (via osha.gov)

Non-ionizing radiation is described as a series of energy waves composed of oscillating electric and magnetic fields traveling at the speed of light. Nonionizing radiation includes the spectrum of ultraviolet (UV), visible light, infrared (IR), microwave (MW), radio frequency (RF), and extremely low frequency (ELF). Lasers commonly operate in the UV, visible, and IR frequencies. Non-ionizing radiation is found in a wide range of occupational settings and can pose a considerable health risk to workers if not properly controlled. The following OSHA Safety and Health Topics Pages provide links to technical and regulatory information on the control of occupational hazards from nonionizing radiation and are available at: https://www.osha.gov/SLTC/radiation_nonionizing/index.html

Extremely Low Frequency Radiation (ELF)

Extremely Low Frequency (ELF) radiation at 60 HZ is produced by power lines, electrical wiring, and electrical equipment. Common sources of intense exposure include ELF induction furnaces and high-voltage power lines.

Radiofrequency and Microwave Radiation

Microwave radiation (MW) is absorbed near the skin, while radiofrequency (RF) radiation may be absorbed throughout the body. At high enough intensities both will damage tissue through heating. Sources of RF and MW radiation include radio emitters and cell phones.

Infrared Radiation (IR)

The skin and eyes absorb infrared radiation (IR) as heat. Workers normally notice excessive exposure through heat sensation and pain. Sources of IR radiation include heat lamps and IR lasers.

Visible Light Radiation

The different visible frequencies of the electromagnetic (EM) spectrum are "seen" by our eyes as different colors. Good lighting is conducive to increased production, and may help prevent incidents related to poor lighting conditions. Excessive visible radiation can damage the eyes and skin.

Ultraviolet

Ultraviolet radiation (UV) has a high photon energy range and is particularly hazardous because there are usually no immediate symptoms of excessive exposure. Sources of UV radiation in the laboratory include black lights and UV lasers.

Laser Hazards

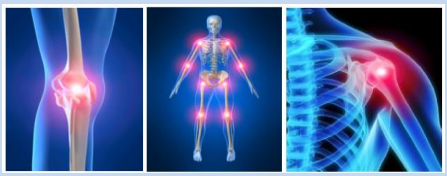
Lasers typically emit optical (UV, visible light, IR) radiations and are primarily an eye and skin hazard. Common lasers include CO2 IR laser; helium - neon, neodymium YAG, and ruby visible lasers, and the Nitrogen UV laser. LASER is an acronym, which stands for Light Amplification by Stimulated Emission of Radiation.

The laser produces an intense, highly directional beam of light. The most common cause of laser induced tissue damage is thermal in nature, where the tissue proteins are denatured due to the temperature rise following absorption of laser energy. The human body is vulnerable to the output of certain lasers, and under certain circumstances, exposure can result in damage to the eyes and skin.

Research relating to injury thresholds of the eye and skin has been carried out in order to understand the biological hazards of laser radiation. It is now widely accepted that the human eye is almost always more vulnerable to injury than human skin.

Source: OSHA Laboratory Safety Guidance on www.osha.gov

Ergonomics



Contributed by Samantha Hardy, EHS Student Intern

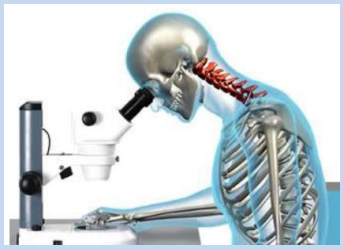
Prevention of Musculoskeletal Disorders in the Workplace

Musculoskeletal disorders (MSDs) affect the muscles, nerves, blood vessels, ligaments and tendons. Workers in many different industries and occupations can be exposed to risk factors at work, such as lifting heavy items, bending, reaching overhead, pushing and pulling heavy loads, working in awkward body postures and performing the same or similar tasks repetitively. Exposure to these known risk factors for MSDs increases a worker's risk of injury.

Work-related MSDs can be prevented. Ergonomics --- fitting a job to a person --- helps lessen muscle fatigue, increases productivity and reduces the number and severity of work-related MSDs.

Examples of Musculoskeletal Disorders (MSDs)

- Carpal tunnel syndrome
- Tendinitis
- Rotator cuff injuries (affects the shoulder)
- Epicondylitis (affects the elbow)
- Trigger finger
- Muscle strains and low back injuries



Impact of MSDs in the Workplace

- Work related MSDs are among the most frequently reported causes of lost or restricted work time.
- According to the Bureau of Labor Statistics (BLS) in 2013, MSD1 cases accounted for 33% of all worker injury and illness cases.

A Process for Protecting Workers

Employers are responsible for providing a safe and healthful workplace for their workers. In the workplace, the number and severity of MSDs resulting from physical overexertion, and their associated costs, can be substantially reduced by applying ergonomic principals.

Implementing an ergonomic process is effective in reducing the risk of developing MSDs in high-risk industries as diverse as construction, food processing, firefighting, office jobs, healthcare, transportation and warehousing. The following are important elements of an ergonomic process:

- Provide Management Support - A strong commitment by management is critical to the overall success of an ergonomic process. Management should define clear goals and objectives for the ergonomic process, discuss them with their workers, assign responsibilities to designated staff members, and communicate clearly with the workforce.
- Involve Workers - A participatory ergonomic approach, where workers are directly involved in worksite assessments, solution development and implementation is the essence of a successful ergonomic process. Workers can:
  - Identify and provide important information about hazards in their workplaces
  - Assist in the ergonomic process by voicing their concerns and suggestions for reducing exposure to risk factors and by evaluating the changes made as a result of an ergonomic assessment
  - Provide Training - Training is an important element in the ergonomic process. It ensures that workers are aware of ergonomics and its benefits, become informed about ergonomics related concerns in the workplace, and understand the importance of reporting early symptoms of MSDs
  - Identify Problems - An important step in the ergonomic process is to identify and assess ergonomic problems in the workplace before they result in MSDs

Ergonomics continued…

- Encourage Early Reporting of MSD Symptoms - Early reporting can accelerate the job assessment and improvement process, helping to prevent or reduce the progression of symptoms, the development of serious injuries, and subsequent lost-time claims.

- Implement Solutions to Control Hazards - There are many possible solutions that can be implemented to reduce, control or eliminate workplace MSDs.

- Evaluate Progress - Established evaluation and corrective action procedures are required to periodically assess the effectiveness of the ergonomic process and to ensure its continuous improvement and long-term success. As an ergonomic process is first developing, assessments should include determining whether goals set for the ergonomic process have been met and determining the success of the implemented ergonomic solutions.

If you require an ergonomic assessment to adjust your workspace (either office or lab), contact: Ron Souza in the Environmental Health and Safety Office at: (207) 602-2488 or rsouza@une.edu

Tips for Using Laboratory Hoods and Safety Cabinets

- Remove false fronts and supplies from under the work area.
- Use anti-fatigue floor mats if standing for long periods.
- Adjust your chair height and sit back in the seat using the backrest.
- Use footrests and foot rings for leg support.
- Avoid resting your forearms on hard edges.
- Pad forearms, elbows or hard edges. (Avoid interference with air flow.)
- Position work supplies as close as possible.
- Place equipment on approved turntables for easy retrieval.
- Use diffused lighting to limit glare.
- Take short breaks to stretch muscles and relieve forearm and wrist pressure.

Tips for Using a Microscope

- Use a chair that provides good back support.
- Sit close to your work surface.
- Remove false fronts and supplies from under the bench work area.
- Avoid leaning on hard edges.
- Pad forearms and edges.
- Keep elbows close by your sides.
- Work with wrists in straight, neutral positions.
- Adjust your chair, workbench, or microscope as needed to maintain an upright head position.
- Elevate, tilt or move the microscope close to the edge of the counter to avoid bending your neck.
- Use adjustable eye-pieces or mount your microscope on a 30° angle stand for easier viewing.
- Keep scopes repaired and clean.
- Spread microscope work throughout the day and between several people, if possible.
- Take breaks. Every 15 minutes, close your eyes or focus on something in the distance. Every 30-60 minutes, get up to stretch and move.

Tips for Pipetting

- Use anti-fatigue floor mats if standing for long periods.
- Sit supported against the backrest of your chair.
- Sit or stand close to your work at bench cut outs.
- Adjust your chair to work height rather than jutting out your chin or bending your neck down when working.
- Elevate your chair rather than reaching up to pipette.
- Do not twist or rotate your wrist while pipetting.
- Alternate or use both hands to pipette.
- Hold the pipetter with a relaxed grip.
- Use minimal pressure while pipetting.
- Use light force or two hands to change tips.
- Use low profile tubes, solution containers and waste receptacles.
- Select a light-weight pipetter sized for your hand.
- Use pipetters with finger aspirators and thumb dispensers to reduce thumb strain.
- Use latch-mode or electronic pipetters for repetitive pipetting.
- Take a 1 to 2 minute break after every 20 minutes of pipetting.

Source: OSHA Safety and Health Topics https://www.osha.gov/SLTC/ergonomics/index.html

Shipping Dry Ice

By Peter Nagle

Dry ice is often used as a refrigerant for specimen samples during transportation. When shipped by highway or railway dry ice is not regulated as a hazardous material. However, when shipped by air or water it is regulated by both the US Department of Transportation (DOT) and the International Air Transport Association (IATA) as a hazardous material and must be packaged and shipped by a trained individual, even if the material it is refrigerating is considered non-hazardous. Researchers or other personnel need to be aware of this regulation because anyone who wishes to ship dry ice by air or water but has not taken any training to ship dry ice cannot legally prepare a shipment or sign an air-bill.

When shipping samples on dry ice or shipping dry ice alone over short distances, do not assume it will automatically be transported by ground. Contact the transporter to make sure it is going by ground and not by air or water. If you need to ship dry ice by air, you must contact the UNE Environmental Health and Safety department for assistance. There are packaging and labeling requirements that must be followed when shipping dry ice by air. In this case only a trained individual can pack the items and sign the air bill.

Specimens may or may not be regulated. Specimens exempted from regulation include:

1. Substances that do not contain infectious substances
2. Substances containing micro-organisms which are non-pathogenic to humans
3. Specimens for which there is a minimal likelihood of being infectious

If the material is not exempted and is considered hazardous then DOT regulations would apply. In this case you would need to contact a trained individual in EHS for assistance.

Please keep these regulations in mind the next time you ship any package containing dry ice. Contact EHS if you need specialized training to ship dry ice.

OSHA® QuickFacts

Laboratory Safety
Cryogens and Dry Ice

Cryogens are substances used to produce very low temperatures [below -153°C (-243°F)], such as liquid nitrogen (LN_2) which has a boiling point of -196°C (-321°F), that are commonly used in laboratories. Although not a cryogen, solid carbon dioxide or dry ice which converts directly to carbon dioxide gas at -78°C (-109°F) is also often used in laboratories. Cryogens, as well as dry ice, can be hazardous to workers if not handled properly.

Never handle dry ice or LN_2 with bare hands.

General Precautions When Working with Dry Ice or LN_2

- Avoid eye or skin contact with these substances.
- Never handle dry ice or LN_2 with bare hands.
- Use cryogenic gloves, which are designed specifically for working in freezers below -80°C and for handling containers or vials stored in these freezers.
- Cryogenic gloves need to be loose-fitting so that they can be readily removed if LN_2 splashes into them or a piece of dry ice falls into them.
- Always use appropriate eye protection.
- Do not use or store dry ice or LN_2 in confined areas, walk-in refrigerators, environmental chambers or rooms without ventilation. A leak in such an area could cause an oxygen-deficient atmosphere.
- Never place a cryogen on tile or laminated counters because the adhesive will be destroyed.
- Never store a cryogen in a sealed, airtight container at a temperature above the boiling point of the cryogen; the pressure resulting from the production of gaseous carbon dioxide or nitrogen may lead to an explosion.
- For more information about specific cryogens, read the Material Safety Data Sheet for the substance in question.

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Cryogens and Dry Ice

continued from page 1

First Aid

- In case of exposure to cryogens or dry ice, remove any clothing that is not frozen to the skin. Do NOT rub frozen body parts because tissue damage may result. Obtain medical assistance as soon as possible.
- Place the affected part of the body in a warm water bath (not above 40°C). Never use dry heat.

Do not use or store dry ice or LN_2 in confined areas, walk-in refrigerators, environmental chambers or rooms without ventilation.

Source: www.osha.gov

UNE Chemical Sharing Program

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 from the Marine Science Center:

- Dimethyl sulfoxide
- Trizma base
- Potassium acetate
- Glycerol
- Ficoll
- Polyvinyl alcohol
- Xylene cyanole FF
- Agarose clarifier additive
- Polyoxyethylenesorbitan monolaurate
- Antifoam 204
- Ammonium persulfate 98+%

Please email:
jtyre@une.edu
if you are interested in any of these items.

Lab Safety Video of the Month:

Flinn Scientific Laboratory Safety Challenge

https://www.youtube.com/watch?v=V-fNpaOX0-g

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