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EHS Lab Chatter

UNIVERSITY OF NEW ENGLAND
INNOVATION FOR A HEALTHIER PLANET

ENVIRONMENTAL HEALTH AND SAFETY

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Safety Spotlight

Emergency Preparedness in Labs

by Jessica Tyre

Emergencies can happen at any moment and being prepared for them can prevent catastrophic consequences. At UNE the goal during an emergency is to protect all lives first and foremost. In addition we also want to prevent loss of research, facilities, property and equipment. Here are just a few tips from EHS on how to help prepare your lab for an emergency:

- **Fill out EHS Emergency Contact cards and mount them in a conspicuous location.** These cards should have two lab contacts, and at least one cell phone number should be provided.
  - These cards will be used by room occupants, Security, emergency services, etc. to contact lab PIs in order to gather information an emergency scenario.
- **Keep your chemical inventory up to date.** EHS may be providing emergency services with a list of chemicals present in lab spaces in emergency situations. We need the inventory to be as up to date as possible.
- **Always make sure life safety equipment is in place and inspected.** If you notice that emergency lighting is not functioning, fire extinguishers are missing or not inspected, or eyewashes aren't operational, you should immediately place a work order to have the issue corrected.
- **Follow all safety policies, procedures, and protocols.** Labs must follow all safety policies and procedures set forth by all federal, state and institutional rules and regulations.
- **Train all students, staff, volunteers, and visitors.** Anyone who enters your lab space should know emergency protocols and where to find life safety equipment. It is important for PIs to train each person working/observing in their lab space on safety policies and procedures.
- **Report all incidents to UNE Security.** Report all fires, chemical spills, biological agent exposures, illnesses and injuries to UNE Security. They will get you in touch with the necessary parties inside and outside of UNE. Even if you feel it is minor, it could turn into something more later.

There are many other ways to keep your lab prepared but these are a few very essential measures that should be taken in all laboratories across all campuses. Contact EHS with questions or concerns.

Emergency Evacuation Procedures

By Peter Nagle

Recently Don Clark, Director of Safety and Security emailed the 2017 Clery Report to all UNE faculty and staff. The report is represented primarily as a crime statistics and policy report; however there are important fire safety, emergency and evacuation procedures that everyone must be aware of within the document. Below is a review of procedures covered in the report that must be followed during a fire or evacuation.

What to Do...

If you notice a fire

- Pull the fire alarm as you exit the building.
- Dial 911 from a safe location.
- State that you are calling from UNE (specify Biddeford or Portland campus).
- Provide the proper name of the building, floor, and room numbers.
- Specify fire type (chemical, paper, wood, electrical, etc.).
- Direct fire/emergency personnel to location.
- Notify Department of Safety and Security at extension 366.
- Proceed to your designated muster location (see card posted in offices throughout both campuses).
- If you are unable to use the stairs for any reason, wait for rescue in the nearest stairwell. Stairwells are designated "areas of refuge."

If you hear a fire alarm

- Immediately proceed to the nearest exit marked by an exit sign.
- Doors and, if possible, windows should be closed as the last person leaves the room or area.
- Evacuate the building quickly, but do not panic or run.
- Proceed and gather at your building muster point. The muster point should be communicated by faculty, staff or a designated person and posted in offices and laboratories throughout campus.
- Try to account for all faculty, staff or students in your area to ensure all occupants have left the building.
- If you suspect people are still in the building, immediately notify Security or emergency personnel.

We are all responsible for being aware of what to do in case of a fire, so please review the evacuation procedures and muster point locations. These can be found in the 2017 Clery Report on pages 31-38. The Clery report can be found on the UNE Safety and Security website at the following address:

https://www.une.edu/sites/default/files/2017_clery_final_sept17_draft_full_report_-_final_dc.pdf

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Things to consider if you (employee) are injured at work:

1. Dial 602-2298 or 9-1-1 if you need emergency care.
2. Contact UNE Security or HR within 24 hours of injury/illness to complete an accident/incident report (either department has the form available).
3. If you need to seek non-emergency medical treatment please go to:

SMHC WorkWell	Concentra	ConveneintMD
One Medical Center Drive Biddeford, ME 04005 (207) 283-7600 (Appointments Only)	85 Western Ave. S. Portland, ME 04106 (207) 774-7751 (Walk-Ins Only- Please notify HR first if you wish to go to Concentra so they can call ahead and give verbal authorization for treatment.)	191 Marginal Way Portland, ME 04106 (207) 517-3838 Also have Wesbrook and Brunswick locations (Open 8a-8p, 7 days/week. No appointment needed!)

4. Keep HR informed of your work-related injury or illness.

· Let HR know if you miss time from work due to your injury.

· Communicate with HR any restrictions you may have because of your injury.

· Keep your supervisor informed of any anticipated missed time from work due to your injury (i.e. doctor appointments).

Contact Cat Martins, Human Resources at cmartins@une.edu or 602-2394 with any questions or concerns.

October is the UNE Commuter Challenge!

- Register with GoMaine (gomaine.nuride.com/une)
- Carpool, ride the bus, bike or walk to work
- Log your rides with GoMaine (gomaine.nuride.com/une)
- Collect your reward points and redeem for discounts and coupons
- Earn swag prizes each week during October
- Participate in a Transportation Tuesday coffee/donut commute

Find out more about the Transportation Tuesday events and raffle prizes by contacting the Sustainability Office or stopping by the tables:

Commons Skybridge: October 3rd,10th, and 17th; 12:00-2:00

Alexander Lobby: October 3rd and 10th; 11:45-1:00

Ductless Fume Hood Safety: Protecting People and Processes:

Due to the lack of ductwork and infrastructure requirements, ductless fume hoods offer convenience and cost-savings while maintaining worker safety

By Erica Tennenhouse | January 19, 2018 Via Lab Manager Magazine

INTRODUCTION

A ductless fume hood is a self-contained laboratory enclosure that passes contaminated air through filters before returning the air directly back to the laboratory. Ductless fume hoods are not connected to an exhaust system, and they usually feature activated carbon filters. These systems are often selected for use in locations where outside ventilation cannot be achieved. In addition to removing a large amount of hazardous fumes, vapors, and particles from the laboratory, ductless fume hoods also result in energy and cost savings, offer mobility, and are convenient to use due to the lack of complex duct work and infrastructure requirements.

Considerations for protecting operators

The primary function of a ductless fume hood is to protect the individuals working within it. Exposure to the fumes, vapors, and particles emanating from chemicals being used in experiments can result in injuries and, in extreme cases, death. Inward airflow must be within a specific range in order to safely remove hazardous materials; if airflow falls below a minimum value, these materials may flow out of the fume hood and pose hazards to laboratory staff. The effectiveness of a fume hood also relies on filters that are capable of removing the hazardous materials in question. It is essential that fume hood users have a means of monitoring both the airflow and filter conditions so that they may respond immediately if the fume hood's safety is compromised. The customer and ductless manufacturer must work together to ensure proper selection of the correct hood too meet the laboratory application demand.

Considerations for protecting processes

In addition to protecting users, a ductless fume hood can help to protect precious samples. Optimal airflow prevents samples from being contaminated by either the user or any materials floating around in the lab. The risk of background or cross-contamination of samples can also be avoided with appropriate filtration. Once again, a monitoring system is required to ensure that conditions in the fume hood remain safe for samples and experiments.

Features of a safe ductless fume hood

- •Blower capable of maintaining face velocity at a safe opening per relevant standard. Face velocity is the pull at the opening of the fume hood that moves air from the laboratory room into the hood. The fume hood must maintain optimum face velocity for adequate fume containment.
- •Vapor-proof illumination adequate for work area. Vapor-proof illuminators help meet safety requirements in applications involving flammable dust or vapor, while providing the operator with adequate lighting.
- •Work area access. Users should have free and easy access to the fume hood's work area through an adequate opening in order to set up and run experiments.
- • Integral spill base. An integral spill base can effectively contain any accidental spills that may occur during chemical manipulation in the fume hood.
- • Reliable method to monitor carbon filter bed saturation per ANSI Z9.5. This set of criteria for laboratory ventilation states that carbon filters must be monitored for saturation.
- • Reliable airflow measurement device per 29 CFR 1910.1450. This standard states that fume hoods must maintain an airflow capable of drawing air from the laboratory and preventing or minimizing the escape of air contaminants into the laboratory.

•Constructed from application appropriate materials to prevent hood deterioration. To ensure fume hood longevity, the interior materials must resist attack from the acid fumes, vapors, and the range of temperatures they will be exposed to.

•Rear baffle to promote even airflow. Baffles are moveable partitions used to create slotted openings along the back of the fume hood that help to maintain even airflow.

Safety Tips

Selecting a ductless fume hood with safety features is key, but laboratory staff must also be trained to use the fume hood correctly. The Occupational Health and Safety Administration offers the following tips for staying safe while working with a fume hood:

- Make sure that you understand how the fume hood works and are trained to use it properly
- If you are unsure about the hazards of any of the chemicals you are working with, refer to the appropriate Safety Data Sheet
- Ensure that the fume hood is on
- Open the sash to the proper operating level, which is usually indicated by arrows on the frame
- Make sure that the air flow is within the required range
- Never allow your head to enter the plane of the hood opening
- Always wear appropriate eye protection
- Make sure that nothing blocks the airflow through the baffles or the baffle exhaust slots
- Keep large equipment elevated at least two inches off the base of the fume hood
- Keep all materials inside the hood at least six inches away from the sash opening
- When not working in the hood, keep the sash closed
- Do not permanently store any chemicals inside the hood

Conclusion

While conventional fume hoods are still the most common choice for ventilating hazardous airborne materials from the laboratory, ductless fume hoods are gaining in popularity. Their appeal is related to their associated cost and energy savings, and convenience. However, when it comes to lab work, safety comes first. It is essential that you consider the features of a safe ductless fume hood prior to purchasing a system for your lab. With these features in place, and with properly trained staff, a ductless fume hoods is well-equipped to protect both the people and the processes in your lab from potential injury and contamination, respectively.

The Culture of Laboratory Safety (Part 2)
By Ron Souza

Source: Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards

SPECIAL SAFETY CONSIDERATIONS IN ACADEMIC LABORATORIES

Academic laboratories, like industrial and governmental laboratories, are concerned with meeting the fundamental safety goals of minimizing accidents and injuries, but there are differences. Forming the foundation for a lifelong attitude of safety consciousness, risk assessment, and prudent laboratory practice is an integral part of every stage of scientific education—from classroom to laboratory and from primary school through postdoctoral training. Teaching and academic institutions must accept this unique responsibility for attitude development.

Resources are limited and administration must provide support for teachers who are not subject matter experts. The manifold requirements for record keeping and waste handling can be especially burdensome for overworked teachers in high school or college laboratories. Institutions with graduate programs teach, but they also conduct research activities that often involve unpredictable hazards. The safety goals and the allocation of resources to achieve them are sufficiently different for high school, undergraduate, and graduate teaching laboratories that they are discussed separately here.

High School Teaching Laboratories

Laboratory safety involves recognizing and evaluating hazards, assessing risks, selecting appropriate personal protective equipment, and performing the experimental work in a safe manner. Training must start early in a chemist's career. Even a student's first chemical experiments should cover the proper approach to understanding and dealing with the hazardous properties of chemicals (e.g., flammability, reactivity, corrosiveness, and toxicity) as an introduction to laboratory safety and should also teach sound environmental practice when managing chemical waste. Advanced high school chemistry courses should assume the same responsibilities for developing professional attitudes toward safety and waste management as are expected of college and university courses.

Undergraduate Teaching Laboratories

Undergraduate chemistry courses are faced with the problem of introducing inexperienced people to the culture of laboratory safety. Although some students enroll in their first undergraduate course with good preparation from their high school science courses, many others bring little or no experience in the laboratory. They must learn to evaluate the wide range of hazards in laboratories and learn risk management techniques that are designed to eliminate various potential dangers in the laboratory.

Undergraduate laboratory instruction is often assigned to graduate—and in some cases undergraduate—teaching assistants, who have widely different backgrounds and communication skills. Supervising and supporting teaching assistants is a special departmental responsibility that is needed to ensure the safe operation of the undergraduate laboratories in the department. The assistants are teaching chemistry while they are trying to learn it and teaching safety when they may not be prepared to do so. However, they are in a position to act as role models of safe laboratory practice for the students in the laboratory, and adequate support and training are required for them to fill that role appropriately.

To this end, a manual designed and written specifically for teaching assistants in undergraduate laboratories is an extremely effective training tool. The manual can include sections on principles of laboratory safety; laboratory facilities; teaching assistant duties during the laboratory session; chemical management; applicable safety rules; teaching assistant and student apparel, teaching assistant and student personal protective equipment; departmental policy on pregnant students in laboratories; and emergency preparedness in the event of a fire, chemical spill, or injury in the laboratory.

safety culture continued...

There should be resolute commitment by the entire faculty to the departmental safety program to minimize exposure to hazardous materials and unsafe work practices in the laboratory. Teaching safety and safe work practices in the laboratory should be a top priority for faculty as they prepare students for careers in industrial, governmental, academic, and health sciences laboratories. By promoting safety during the undergraduate and graduate years, the faculty will have a significant impact not just on their students but also on everyone who will share their future work environments.

Academic Research Laboratories

Advanced training in safety should be mandatory for students engaged in research, and hands-on training is recommended whenever possible. Unlike laboratory course work, where training comes primarily from repeating well-established procedures, research often involves making new materials by new methods, which may pose unknown hazards. As a result, workers in academic research laboratories do not always operate from a deep experience base.

Thus, faculty is expected to provide a safe environment for research via careful oversight of the student's work. Responsibility for the promotion of safe laboratory practices extends beyond the EHS department, and all senior researchers—faculty, postdoctoral, and experienced students—should endeavor to teach the principles and set a good example for their associates. The ability to maintain a safe laboratory environment is necessary for a chemist entering the workforce, and students who are not adequately trained in safety are placed at a professional disadvantage when compared with their peers. To underscore the importance of maintaining a safe and healthy laboratory environment, many chemistry departments provide laboratory safety training and seminars for incoming graduate students. However, in many cases these sessions are designed to prepare graduate students for their work as teaching assistants rather than for their work as research scientists.

Formal safety education for advanced students and laboratory personnel should be made as relevant to their work activities as possible. Training conducted simply to satisfy regulatory requirements may seem like compliance, and researchers may sense that the training does not have the leader's full support. EHS offices and researchers can work together to address such concerns and to design training sessions that fulfill regulatory requirements, provide training perceived as directly relevant to the researchers' work, and provide hands-on experience with safety practices whenever possible.

Safety training is an ongoing process, integral to the daily activities of laboratory personnel. As a new laboratory technique is formally taught or used, relevant safe practices should be included; however, informal training through collegial interactions is a good way to exchange safety information, provide guidance, and reinforce good work habits.

Although principal investigators and project managers are legally accountable for the maintenance of safety in laboratories under their direction, this activity, like much of the research effort, is distributable. Well-organized academic research groups develop hierarchical structures of experienced postdoctoral research associates, graduate students at different levels, undergraduates, and technicians, which can be highly effective in transmitting the importance of safe, prudent laboratory operations.

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Tips for Encouraging a Culture of Safety within an Academic Laboratory

- •Make a topic of laboratory safety an item on every group meeting agenda.
- •Periodically review the results of laboratory inspections with the entire group.
- •Encourage students and laboratory employees to contact the EHS office if they have a question about safe methods of handling hazardous chemicals.
- •Require that all accidents and incidents, even those that seem minor, are reported so that the cause can be identified.
- •Review new experimental procedures with students and discuss all safety concerns. Where particularly hazardous chemicals or procedures are called for, consider whether a substitution with a less hazardous material or technique can be made.
- • Make sure the safety rules within the laboratory (e.g., putting on eye protection at the door) are followed by everyone in the laboratory, from advisor to undergraduate researcher.
- •Recognize and reward students and staff for attention to safety in the laboratory.

When each principal investigator offers leadership that demonstrates a deep concern for safety, fewer people get hurt. If any principal investigator projects an attitude that appears to be cavalier or hostile to the university safety program, that research group and others can mirror the poor example and exhibit behavior that sets the stage for potential accidents, loss of institutional property, and costly litigation.

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.

Items available:

No Items currently available. Please check back next issue!

To contribute a topic or article to EHS Lab Chatter,

email:jtyre@une.edu

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