

**In this issue of the Environmental Health and Safety (EHS) Listserv, April 13, 2015:**

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## **1. RSVP NOW - Safety Colloquium April 15**

**“Safety Culture: Perspectives and Practices,”** the Spring Safety Colloquium co-sponsored by EHS and the Office of Research and Economic Development, will be held on April 15, 2015, at Nebraska City Union. This colloquium will feature Sean Kaufman, respected educator, consultant and behavioral solutions expert. For over 15 years, Sean Kaufman has assisted leaders and individuals around the world with behavioral-based improvement solutions. The overall outcome has increased organizational safety, shifted workforce cultures, elevated leadership skills, and enhanced quality of life – both personally and professionally.

This colloquium will be applicable to everyone with a stake in safety, especially laboratory researchers, PIs, safety committee chairs, department heads and deans/directors. This colloquium includes a complimentary lunch. Please RSVP (<http://research.unl.edu/events/event2.php?eventID=1400>) by 5:00 p.m. on Monday, April 13th. This colloquium will be live-streamed through the EHS web site the day of event for those who cannot attend in person (<http://ehs.unl.edu/laboratory-safety-colloquium-series-live-stream>) and will be recorded for future viewing.

### **Resources**

- EHS Safety Colloquium Series <http://ehs.unl.edu/training/Colloquium>

## **2. Laboratory Safety Audit Information for the Campus**

Have you ever wondered what EHS is looking for when they conduct the periodic safety and compliance audit of your UNL laboratory?

EHS is inviting anyone interested to attend any or all of the EHS auditor training sessions listed below, which will be held in the EHS Training Room. No RSVP is required.

- Monday, 5/4/15, **Chemical Safety**, 1:00 – 3:00 p.m.
- Wednesday, 5/6/15, **Electrical Safety**, 9:00 – 10 a.m.
- Wednesday, 5/6/15, **Compressed Gas Cylinders**, 10:30 – 11:00 a.m.

- Wednesday, 5/6/15, **Ventilated Cabinets**, 11:30 a.m. – 12:00 p.m.
- Friday, 5/8/15, **Hazardous Waste Management**, 9:00 a.m. – 10:30 a.m.
- Friday, 5/8/15, **Personal Protective Equipment**, 11:00 a.m. – 11:30 a.m.
- Monday, 5/11/15, **Lab and Engineering Controls**, 9:00 a.m. – 10:00 a.m.
- Monday, 5/11/15, **Administrative and Other Safety Concerns**, 10:30 a.m. – 11:00 a.m.
- Monday, 5/11/15, **Special Topics For Further Investigation**, 11:00 a.m. – 12:00 p.m.

NOTE: Attendance does not substitute for **Chemical Safety Training** or any other training which may be required as noted in the “*Training Needs Assessment for EHS-Related Topics*.”

### Resources

- **Safety Audit Guidelines** SOPs <http://ehs.unl.edu/sop/safety-audit-guidelines>
- *Training Needs Assessment for EHS-Related Topics* [http://ehs.unl.edu/Training\\_Needs\\_Assessment.pdf](http://ehs.unl.edu/Training_Needs_Assessment.pdf)

## 3. Promoting an Academic Safety Culture, Recommendation #8

Recently the National Research Council (NRC), the principal operating arm of the National Academy of Sciences and the National Academy of Engineering, completed work on a publication titled “**Safe Science: Promoting a Culture of Safety in Academic Chemical Research**.” The recommendations within this report apply beyond chemical laboratories/research.

The shift away from mere compliance and toward promoting a strong, positive safety culture has already yielded benefits in other industries. The hope is that the NRC recommendations help move academic institutions toward the adoption of a culture of safety that goes beyond inspections, standard operating procedures, and safety plans, all with the ultimate goal of protecting the lives and health of the campus community.

Recommendations from this report will be reviewed one-by-one in each successive issue of the EHS listserv. The eighth recommendation is:

*The researcher and principal investigator should incorporate hazard analysis into laboratory notebooks prior to experiments, integrate hazard analysis into the research process, and ensure that it is specific to the laboratory and the research topic area.*

Training in risk assessment concepts and ongoing mentoring and support is an essential element in developing and sustaining a strong, positive safety culture. This is particularly important in academic labs where workers are often relatively young and have limited experience. Entering (and even experienced) students may not know how to assess the risks of what they are doing, how to assess changes in risks if they change a key experimental parameter, or how to keep a small error from causing major problems. Moreover, they may not realize that a process they used in

the past without apparent incident could be dangerous with slightly changed conditions.

Safety is a priority at UNL. Make sure it is a priority in your individual work location, laboratory or otherwise. To this end, consider adopting the following as your personal ethic:

- **Value safety:** Safety is an integral part of what one does, its automatic, and it does not change its priorities- it is never questioned and never compromised.
- **Work safely:** One continues to learn about safety, learns to recognize hazards, assesses the risks of hazards, manages the risks of hazards, and prepares to handle emergencies.
- **Prevent at-risk behavior:** One does not cut corners or bypass safety measures and shares this information with others, as needed.
- **Promote safety:** One encourages and acknowledges others for working safely.
- **Accept responsibility for safety:** One takes steps to work safely, setting a positive example for others, and being accountable for safety.

#### Resources

- NRC free download/read online: "**Safe Science: Promoting a Culture of Safety in Academic Chemical Research (2014)**"  
[http://www.nap.edu/catalog.php?record\\_id=18706&utm\\_expid=4418042-5.krRTDpXJQISoXLpdo-1Ynw.0&utm\\_referrer=http%3A%2F%2Fwww8.nationalacademies.org%2Fonpinews%2Fnewsitem.aspx%3FRecordID%3D18706](http://www.nap.edu/catalog.php?record_id=18706&utm_expid=4418042-5.krRTDpXJQISoXLpdo-1Ynw.0&utm_referrer=http%3A%2F%2Fwww8.nationalacademies.org%2Fonpinews%2Fnewsitem.aspx%3FRecordID%3D18706)
- American Chemical Society, Safety Practices and Recommendations (Publications):  
<http://www.acs.org/content/acs/en/about/governance/committees/chemicalsafety/safetypractices.html>
- American Chemical Society, pages 3-6, "**Increasing Safety Awareness: An Academic Imperative**":  
<http://www.acs.org/content/dam/acsorg/about/governance/committees/training/cptnewsletter/committee-on-professional-training-summer-2014.pdf>
- American Chemical Society "**Identifying and Evaluating Hazards in Research Laboratories**"  
<http://www.acs.org/content/dam/acsorg/about/governance/committees/chemicalsafety/identifying-and-evaluating-hazards-in-research-laboratories-draft.pdf>

#### 4. Overexertion: Don't Be a Statistic

According to the National Safety Council, overexertion is one of the most common causes of injuries in the United States. At UNL overexertion is consistently the third highest cause of injury, accounting for an average 16% of total injuries. Overexertion injuries generally fall into two categories – sprains (stretching or tearing ligaments) and strains (stretching or tearing tendons or muscles). These types of injuries have been associated with lifting, repeated bending at the waist with twisting, long term

bending at the waist, pushing/pulling, carrying, reaching, long term poor posture (either sitting or standing) and sitting while absorbing vibration through the body (for example, while driving a truck or other vehicle).

Overexertion may occur when the load, whether lifted, carried, pushed, pulled or otherwise handled, exceeds the limits of the human joint system doing the work. Overexertion can occur within any setting and is more common when a task is infrequently performed, such as seasonal tasks.

The National Institute for Occupational Safety and Health (NIOSH) recommends both administrative controls and worker training on measures to avoid this cause of injury. Administrative controls to reduce overexertion injuries include:

- Plan the workflow to avoid unnecessary lifts, or minimize the distances loads must be carried. Perform the task with your brain before you perform it with your body!
- Note all heavy or unstable loads. Reduce the weight by putting fewer items in a container or using smaller or lighter-weight containers.
- Rearrange contents of containers if possible so the weight is evenly distributed.
- Avoid storing materials on the floor.
- Keep pathways clear to avoid tripping.
- Rotate workers between lifting and non-lifting tasks.

NIOSH recommends workers take the following measures to avoid overexertion injuries when lifting:

- Use mechanical lift devices like a hand truck or pallet jack, when available and needed.
- Before lifting, check the load for stability and weight. Awkward-shaped items can produce stress beyond their weight, so use the same techniques as you would for a heavy load.
- Lift only as much as you can safely handle on your own. If required, make several trips carrying lighter weight or get help and use “team lifting”.
- Keep your back straight and handle material within your maximum comfort zone (approximately shoulder to knee).
- Make sure footing is solid and your feet are positioned shoulder-width apart.
- Use your legs to lift the load rather than your back or upper body, keeping the load as close to the body as possible.
- Use smooth, even motions to avoid jerking. If you have the option, push rather than pull.
- Step to the side when you need to turn, do not twist your body.
- Try to alternate physically demanding tasks with less demanding ones. Avoid taking long sitting breaks, as your muscles may crap up when you resume work.

Exercise and stretching before you begin can help prevent overexertion injuries. Strength training to maintain a strong core can also be beneficial. Drink plenty of fluids as you work to maintain hydration. You don't want to be a statistic!

## Resources

- General Material Handling/Safe Lifting SOP [http://ehs.unl.edu/sop/s-gen\\_safe\\_lifting.pdf](http://ehs.unl.edu/sop/s-gen_safe_lifting.pdf)
- Lisa Linck, "Tips for preventing physical overexertion," Kansas State University, updated 8/24/2012 <http://www.k-state.edu/today/announcement.php?id=1281&category=news&referredBy=email>
- Healthline, "The Understated Injury: Overexertion," May 10, 2013 <http://www.healthline.com/health/understated-injury-overexertion>
- NIOSH Workplace Health Promotion, "Work-Related Musculoskeletal Disorders (WMSD) Prevention" <http://www.cdc.gov/workplacehealthpromotion/implementation/topics/disorders.html>

## 5. Safety Shorts

This series features links to short safety resource(s) each month. Regardless of format - video, PDF, other - these short features cover various topics and are intended as resources for safety committees, faculty/staff/students, as well as individual laboratories/work areas. Each of the following "shorts," provided by *Safety Memos*, has a unique focus and the three are designed to be viewed together.

- Back Safety – Top 10 Lifting Rules – Avoid Back & Spine Injuries, Safety Training Video (duration 2:26). This video reviews proper body mechanics to avoid overexertion in lifting. <https://www.youtube.com/watch?v=LaFoZR3gd44>
- Back Safety – The Low 5's – Safety Training Video (Duration 3:53). This video covers 5 ways to protect your lower back while lifting. <https://www.youtube.com/watch?v=Y9wjMZcRbSq>
- Back Safety – The High 5's – Prevent Accidents & Injuries – Back Safety Training Video (duration 4:04). This video covers five points to avoid injury while lifting. <https://www.youtube.com/watch?v=r5xiL6Jr4vk>

NOTE: Resources are provided for informational purposes only. Publication does not in any way endorse a particular company or product or affect current UNL policies and procedures.

## 6. Nanotechnology: Be Proactive

Nanotechnology is the understanding, manipulation, and control of matter at dimensions of roughly 1 to 100 nanometers, which is near atomic scale, to produce

new materials, devices, and structures. One nanometer is one-billionth of a meter. Putting this size into perspective, a single human hair is about 80,000 nanometers in width. Engineered nanoscale materials or nanomaterials are materials that have been purposefully manufactured, synthesized, or manipulated to have a size with at least one dimension in the range of approximately 1 to 100 nanometers and that exhibit unique properties determined by their size. Since nanomaterials behave differently from their larger counterparts the door is open to broadened horizons for research and commercial applications.

This is an ever-expanding area of research in a wide variety of fields leading to an estimate by the National Science Foundation of 6 million people working in the nanotechnology field by 2020. Workers within nanotechnology-related industries or conducting nanotechnology research have the potential to be exposed to uniquely engineered materials with novel sizes, shapes, and physical and chemical properties and thus must be proactive in minimizing risk. Occupational health risks associated with manufacturing and using nanomaterials are not yet clearly understood. Minimal information is currently available on dominant exposure routes, potential exposure levels, and toxicity of nanomaterials. Research is continuing toward understanding how the unique properties of nanomaterials may lead to specific health effects.

Several studies have tested nanotechnology's effects on animals. However, one highly publicized case, published in the *American Journal of Industrial Medicine* (Vol. 57, No. 5), involved a human. On a lab bench with no protective measures, a 26-year-old chemist handling nickel nanoparticle powder developed throat irritation, nasal congestion, post-nasal drip, facial flushing and skin reactions to her earrings and belt buckle. Nickel is known to cause sensitization so it is unknown whether the reaction was due to the particle size or not. Researchers need to be particularly mindful of their protective practices when working with nanomaterials. The Occupational Safety and Health Administration (OSHA) notes that published exposure limits for a substance may not be applicable to its nanomaterial counterpart.

NIOSH leads the federal government nanotechnology initiative and provides workshops nationwide to educate researchers and workers on risk assessment and management approaches for nanoparticles. NIOSH has developed a number of publications for nanotechnology guidance. The American Chemical Society (ACS) provides laboratory safety guidelines for handling nanomaterials and an extensive resource listing. Review of up-to-date materials can help the researcher be proactive in minimizing risk.

### **Resources:**

- **Nanoparticle Safety** SOP [http://ehs.unl.edu/sop/s-nanoparticle\\_safety.pdf](http://ehs.unl.edu/sop/s-nanoparticle_safety.pdf)
- EHS Laboratory Colloquium: NIOSH Workshop (June 2013): Building a Risk Management Program for Nanomaterials <http://ehs.unl.edu/training/Colloquium>

- ACS Safety Resources, “Nanotechnology Safety Resources”  
<http://www.acs.org/content/acs/en/about/governance/committees/chemicalsafety/safetypractices/nanotechnology-safety-resources.html>
- Occupational Safety & Health Administration (OSHA), “Working Safely With Nanomaterials” [https://www.osha.gov/Publications/OSHA\\_FS-3634.pdf](https://www.osha.gov/Publications/OSHA_FS-3634.pdf)
- National Nanotechnology Initiative <http://www.nano.gov/>
- NIOSH NANOTECHNOLOGY, Guidance & Publications  
<http://www.cdc.gov/niosh/topics/nanotech/pubs.html>
- Wiley Online Library “Occupational handling of nickel nanoparticles: A case report” <http://onlinelibrary.wiley.com/doi/10.1002/ajim.22344/abstract>

## 7. Revised Safe Operating Procedures (SOPs)

The following SOPs have minor changes to improve clarity or correct typos, links, and/or referenced materials:

- **Automatic External Defibrillators** <http://ehs.unl.edu/sop/s-AED.pdf>
- **First Aid Kits** <http://ehs.unl.edu/sop/s-firstaidkit.pdf>
- **On-the-Job and Student Injuries** <http://ehs.unl.edu/sop/s-injury.pdf>
- **Welding and Cutting Operations** [http://ehs.unl.edu/sop/s-welding %26 cutting operations.pdf](http://ehs.unl.edu/sop/s-welding%26cuttingoperations.pdf)

**Remember...SAFETY IS AN ATTITUDE!**

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