Lab Safety Guide (rev. November 2020)

civil.northwestern.edu /research/Lab_Safety/safetysite.html

1: Introduction:

Students and researchers come to CEE with varied academic backgrounds and experience. Some have extensive knowledge and experience with laboratory chemicals, organisms and equipment. Others have never seen the inside of a chemistry lab since CHEM-102. Unfortunately, our experience has taught us that many people tend to overestimate their expertise in this area. As a result, it is required by both CEE and the Office of Research Safety (ORS) that EVERYONE be given some basic instruction in safe laboratory practice. Required ORS safety courses are taken on-line. What you need is determined by the nature of your work. **You MUST consult your Lab Coordinator before beginning ANY lab work.**

Although it can seem at first to be a huge subject, the basic practices to keep everyone safe and healthy in labs quickly become second nature. In fact, there is one overarching principle from which all safe lab work flows. This is the Golden Rule of Laboratory Safety:

You must plan your response to a chemical spill, injury or other lab mishap BEFORE IT HAPPENS.

THERE IS NO SUBSTITUTE FOR BEING PREPARED!

Laboratory safety concerns are NOT impediments to the work; they are an INTEGRAL PART of it. As a professional, YOU are responsible for the safety of your research, yourself and others who share your lab space. YOU must know the obvious and the not-so-obvious hazards of everything you use and do before you start.

2: Some General Information:

A few basics to get you started:

- The EMERGENCY telephone number is 9-1-1
- NO eating or drinking in laboratories.
- Wear appropriate clothing, footwear and if necessary, Personal Protective Equipment (PPE) in the lab.
- Clutter causes accidents. Neatness = safety.
- DO NOT wear your PPE, such as gloves and lab coats, OUT of the lab.
- If there is a fire alarm, you MUST, BY LAW, leave the building.
- If there is an alarm, please go to our "rally point," Bobb Hall, so we know you are safe. Bobb Hall is north of Tech. There are signs in the A-wing corridors that show where Bobb Hall is.

4: Sources of Lab Safety Information:

There are many places you can go to for information about the chemicals, processes and equipment that you use. It is important to consult these sources freely before you begin your work with the chemical, process or equipment.

These include:

- Northwestern's Office of Research Safety ("ORS"). They are the EXPERTS in all areas of lab safety and they are right here in Tech.
- ORS has collected a WEALTH of useful information here: https://researchsafety.northwestern.edu/safety-information/ . When this guide tells you to check with ORS for information, LOOK HERE FIRST!
- Labels: Your first line of defense. Anything EXTREMELY important will be on the label. Read the label!
- The Equipment Manual: Like reading the label, only for equipment.
- The Walls of Your Lab: Every lab has a copy of this Guide and a list of important phone numbers, as well as any other information that your PI or Lab Coordinator deem useful.
- People: Your PI, your Lab Coordinator and ORS are all VERY happy to provide information and guidance to keep your lab safe and healthy. Please...do not hesitate to ask for advice!
- Material Safety Data Sheets (MSDS): The MSDS provides all of the basic hazard information about a chemical in one convenient document. The vendor should provide an MSDS with every chemical you buy, even if it is just an accessory to a piece of equipment; even WATER has an MSDS.

  A paper copy of the MSDS for EVERY CHEMICAL IN THE LAB must be on file in the lab. There are many sources for MSDSs on-line, but every PI's research group MUST have them on hand in a file or binder.

  Where to get MSDSs:

- The manufacturer or vendor. Often they will have a web site that provides this information. If not, contact them. For obscure substances this may be the only source.
- SIRI: An extensive and free on-line MSDS collection courtesy of the University of Vermont. Go to https://hazard.com/msds/
- https://chemicalsafety.com/sds-search/

A Word about ORS:

The Office for Research Safety provides a whole slate of services FOR FREE, including waste disposal, emergency response, lab safety inspections, and advice on preventing laboratory disasters. They also will provide basic PPE like lab coats, eye protection etc. Their mission is not to get anyone in trouble, but to keep all NU labs both safe and legal. There is no need to be afraid to consult them, or call them in an emergency. They are NOT the "Lab Police!"

5: What to Do in the Event of an EMERGENCY:

In ALL emergency response situations, the first priority of the responder is to NOT create more victims.

In the event of a fire, chemical release or injury, you need to quickly decide if you can handle the problem yourself. Putting yourself or anyone else in danger, or more danger, is not a proper response. This is when the guiding principle of Prior Planning becomes extremely important.

WHEN IN DOUBT, CALL FOR HELP!

This section contains a quick set of guidelines for handling common laboratory emergencies. Detailed response procedures for many types of lab emergencies, including injury, fire and chemical spills, will be found here.

5a- Fire:

PREVENTION is, of course, key:

- Minimize your use and storage of flammable, explosive, reactive or pyrophoric materials. Sometimes there ARE alternatives. Research them
- Regularly review your procedures in handling flammable etc. materials.
- Realize that some things are flammable that you might not think of, such as molten paraffin wax and all sorts of dusts.
- Clutter contributes to fire and its spread. Keep the lab neat.
- ASK your PI, Lab Coordinator or ORS to critique your procedures. New eyes might well see potential problems that you don't recognize.
- Oven Safety: Ovens are a frequent cause of laboratory fires and explosions. Use them wisely:
    - DON'T EVER put flammable chemicals, or items containing or wet with them, in an oven, This can and HAS caused fires and EXPLOSIONS!
    - DO NOT USE MERCURY THERMOMETERS! In fact, they are officially banned in CEE. In the "worst fire" mentioned below, ONE mercury thermometer in the oven that burned turned the entire lab into a hazardous waste site. In addition to all the fire damage, it needed decontamination that delayed repairs by many weeks and was extremely expensive. DO NOT buy mercury thermometers; any you have can be replaced with high-quality non-mercury versions FOR FREE. Ask your Lab Coordinator for details,
    - PLASTICWARE IN OVENS:
        - The WORST FIRE in Department history was caused by someone drying plastic bottles in a laboratory oven. It was made worse by storage of flammable materials directly beneath the oven.
        - Lab ovens have the alarming habit of failing by MAXING OUT their temperature.

- FIND ANOTHER WAY.
- If you MUST dry plastic in an oven:
  * PUT IT IN A VESSEL THAT WILL HOLD THE MOLTEN PLASTIC IF IT MELTS.
  * MONITOR THE OVEN - DO NOT DRY OVERNIGHT.

If a fire DOES occur:

- Time is CRITICAL in a fire. Fires can spread with terrifying speed.
- Can you handle it yourself? Unless the fire is small and very contained, and you have the CORRECT fire extinguisher AND know how to use it, the answer is probably "no." Get out and get help.
- Pulling the fire alarm is the fastest way to summon the fire department and warn others of the danger, so you always need to be aware of the location of the nearest alarm box.
- IF you decide to fight the fire yourself, you MUST:
  - Have on hand a fire extinguisher of the proper type for the fire you are fighting. All labs have a fire extinguisher, but you must make sure you have the correct one or you might just make things worse.
  - Know the proper way to USE that fire extinguisher.
  - The only way to know all this is prior preparation!

5b- Chemical Spills:

Whether or not you can handle a chemical spill yourself depends upon what is spilled, how much and possibly where. As always, PRIOR PLANNING is key to proper response. You will need to have the PROPER EQUIPMENT ready to go.

There is NO advantage to being a hero. When in doubt, get help! Contact ORS, your Lab Coordinator or NU Police. The police can summon ORS Emergency Response teams any time, day or night.

IF a spill occurs and you decide to handle it yourself:

- You need the proper supplies to absorb, sequester, otherwise restrain and collect the spill. Your lab should have a SPILL KIT and you should know where it is; consult your Lab Coordinator on this matter if your lab lacks a spill kit.
- You need the proper PPE.
- You need the proper knowledge.
- It is beyond the scope of this document to detail proper procedures for all the possible spills that can occur. You must prepare yourself AHEAD OF TIME to deal with any spills that might occur in YOUR lab.
- Remember, once you have cleaned up a spill, you then have a WASTE DISPOSAL situation. Notify your Lab Coordinator.

5c- In Case of a Work Related Injury, serious chemical exposure or Illness:

IN THE EVENT OF A SERIOUS INJURY, CALL 911!

The procedures to follow in the event of a lab injury are POSTED in every lab. They should be reviewed BEFORE they are needed. In any more than a minor first aid situation, GET HELP! Given below are brief guidelines abstracted from the ORS web site. Detailed information on ORS and NU procedures and protocols can be found at:

- Emergency procedures main page
- First Aid tips
- General Guidelines in case of injury

  Every lab in CEE has a first aid kit that is maintained by the Lab Coordinator. You should know where it is. PLEASE NOTE that the first aid kit is NOT a source of gloves, tape, scissors, analgesics, etc. for non-first-aid use.

  In the event you are injured or exposed to a hazardous substance, GO TO the link below for instructions for obtaining medical care and accessing any Workers' Compensation benefits to which you may be entitled:

- https://www.northwestern.edu/risk/documents/claims-insurance-documents/workers-compensation-documents/lab-injury-poster-evanston.pdf

  All work-related injuries and illnesses must be reported!

6: The Safe Use of Laboratory Chemicals:

In no area of laboratory safety is the importance of prior preparation more paramount than in your safe use of chemicals and your response to a chemical spill. This cannot be overstated.

6a: General Safe Handling Guidelines:

- Use the APPROPRIATE Personal Protective Equipment (PPE) for the chemicals you are handling.
- EYE PROTECTION IS MANDATORY!
- WORK IN THE FUME HOOD whenever possible. If a substance can emit toxic fumes, dusts or aerosols, you have no choice.
- ALL containers must be PROPERLY labeled. "Properly" has a definition and will be explained in detail below.
- NO EATING, DRINKING or SMOKING in labs where chemicals are used or stored. People HAVE accidentally swallowed reagents.
- NOTHING INSOLUBLE GOES INTO LABORATORY SINK OR FLOOR DRAINS! NOT SOIL, SAND, CEMENT, FLY ASH, AGGREGATE. NOT IN ANY AMOUNT, EVER! It clogs the plumbing. It has cost us much money. YOUR PI WILL GET THE BILL!

  The only exceptions to this are the two SPECIAL DRAINS that are designed to accept SMALL amounts of insoluble material. ASK YOUR LAB COORDINATOR ABOUT THESE.

6b: Prevention and Minimization of Chemical Spills:

- Use the smallest practical AMOUNT of a given substance.
- Use break-resistant packaging and labware if available. Many chemicals are available in plastic or plastic-coated glass bottles - buy them! One of THE most common lab accidents is when a large glass bottle hits the edge of a lab bench and shatters. If the bottle contains four liters of concentrated acid, you have a large problem. A small, plastic or safety-coated bottle = smaller or no problem.
- Secondary containment. This can be as simple as doing your measuring and dispensing on a cafeteria tray, spill pad or paper towel, to placing glass jugs in carriers for transport and use. Safety-coating on bottles is also a type of secondary containment.
- Use of dispensing equipment rather than pouring.
- Anything else you can imagine to prevent or minimize spills.

6c: Safe Storage of Chemicals:

- Keep the lab neat. Put things back when you are done. Minimize use of the lab bench as storage space.
- EVERYTHING must be properly labeled. EVERYTHING. This is detailed below.
- Flammable chemicals MUST be stored in a proper flammables cabinet.
- Carcinogens, mutagens and other highly poisonous materials should be stored away from the normally hazardous materials.
- Chemicals must be stored away from things with which they might react in the event of a spill:
    * Flammables away from oxidizers.
    * Acids away from bases.
    * Monomers away from inducers of polymerization.
    * Photoreactive chemicals away from light.
    * Use your imagination....

6d: Proper Labeling:

- EVERY CONTAINER or VESSEL that contains ANYTHING, MUST BE LABELED. This is so people other than the owner will know what is in it, especially in the event of a spill, exposure, etc. This includes research setups, aging or curing samples, etc. There are NO EXCEPTIONS. Even If it's only WATER, it MUST STILL BE LABELED. There can be SEVERE legal consequences to you AND your PI if a lab is found in violation of this rule by State or Federal inspectors, firefighters, police etc.
- Such inspections, while rare, DO happen, and are usually unannounced. It has happened at Northwestern; it cost THOUSANDS of dollars in fines.
- Proper labeling means that the contents (THE NAME, not formula or cryptic abbreviation), WHO ownsthe container, hazard warnings and WHEN it was filled or bought are clearly discernable.
- The BASIC RULE is that ANYONE encountering the container, regardless of their knowledge of chemical nomenclature, MUST be able to identify the contents. Lots of people who don't know what "KCN" means will know to stay away from POTASSIUM CYANIDE. So, NO ABBREVIATIONS EVER.
- The original vendor's container is probably the best container. Use it whenever possible.
- If a container is TOO SMALL to properly label, it can be coded, but the key to the code must be

PROMINENTLY POSTED IN THE LAB. If you do not understand this, ask your LC for guidance.

- EXPERIMENTS and APPARATUS that contain chemicals must also be labeled. Is that sample soaking in water or 6N sodium hydroxide solution? Anything not KNOWN to be safe MUST be treated as something dangerous by ORS and other emergency personnel, so LABEL EVERYTHING.
- Q: Does even THIS harmless substance need a proper label?
  A: Yes.

This is a proper label. This format tells exactly what it is, whose it is, when it was made and warns of its dangers.

Sulfuric Acid, concentrated
DANGER! CORROSIVE!
06/06/2020
Jane Doe

This is NOT a proper label. It is not even close!

H2SO4
Jane

6e: Spill Response:

- Instructions on how to handle every conceivable chemical spill are beyond the scope of this document. Therefore, it is YOUR responsibility to PLAN IN ADVANCE your response to a spill of the chemicals in your lab. SEEK ADVICE!
- Each lab should have a "spill kit" to facilitate response to small spills. If you do not have one, tell your Lab Coordinator.
- SPILLS MUST BE CLEANED UP. DO NOT just designate certain areas of your lab as inevitably dirty and allow spilled chemicals to accumulate. THIS IS EXTREMELY DANGEROUS and UNPROFESSIONAL. It has caused injuries to lab personnel right here in CEE.

6f: Waste Disposal:

Proper and legal disposal of old reagents, solutions, specimens and the like is the responsibility of every researcher. Improper waste disposal can easily lead to fire, explosion, toxic gas clouds, injury or death for you or someone else. In addition, the legal penalties for improper disposal can be severe.

- If you use chemicals, you will eventually generate chemical waste. Consult with your Lab Coordinator or ORS BEFOREHAND to come up with a waste disposal plan that will minimize effort, prevent accidents and limit legal responsibility. Waste disposal basics are a required on-line training for most lab users.

- The issue of chemical waste handling is rather complex, but it MUST BE ADDRESSED. The mere STORAGE of chemical waste can be hazardous and illegal unless done properly.

- It bears repeating...NOTHING INSOLUBLE GOES INTO LABORATORY SINK OR FLOOR DRAINS!

- ORS will pick up chemical wastes for proper and legal disposal, FOR FREE, provided that those wastes are properly packaged, labeled and documented.

- ORS will also provide the proper waste storage containers and labels for various types of waste, no charge.

- A few (very few) things can go into the regular trash, or into the sink, but YOU MUST BE VERY SURE THAT THIS IS ALLOWABLE BEFORE YOU DO THIS! A list of these materials can be found on the ORS Web site. WARNING: Some allowed materials require pH neutralization that can be rather onerous. It is much better to err on the side of caution. If you cannot do it correctly, use ORS' free waste-disposal service. Remember: NOTHING INSOLUBLE GOES INTO LABORATORY SINK OR FLOOR DRAINS!

7: Homeland Security:

What, you may ask, does my work have to do with Homeland Security? Allow ORS to explain:

"In order for the University to comply with Department of Homeland Security (DHS) rules, you are required to report the possession of any Chemicals of Interest (COIs) that are listed in Appendix A of the Chemical Facility Anti-Terrorism Standards. COIs are chemicals that could impact national security due to release, theft, sabotage, or contamination. The Office for Research Safety (ORS) is charged with coordinating University-wide inventory and reporting the possession of any COIs to DHS. Subsequent to reporting, DHS will assign the University to a risk-based security tier and may require the preparation of Security Vulnerability Assessments and Site Security Plans."

This is NOT a regulation that you wish to violate!

What to do:

- Consult the Chemicals of Interest list, which can be found here (DHS web site): https://www.cisa.gov/sites/default/files/publications/appendix-a-to-part-27-508.pdf
- Be aware that some COMMON laboratory reagents (if present in sufficient amounts) are on the list!
- If you possess or plan to acquire ANY of the chemicals on the COI list, notify ORS or your Lab Coordinator. ORS or your LC will guide you through the record keeping and reporting requirements that might be necessary, depending upon the amount of the COI that you have or plan to have
- Non-compliance can have nasty Federal law-enforcement consequences.

8: Physical Hazards:

There are many ways to be injured in a laboratory that are not inherent to laboratory work. As a result, busy researchers who may be very cognizant of the hazards presented by chemicals and lab apparatus sometimes fail to recognize common dangers that would be glaringly obvious at home or in a workshop. When such accidents occur in a lab, the severity of the incident can be magnified.

Common Lab Dangers:

- Falls, especially from ladders, chairs, kick-steps, overturned buckets, etc.:

    - DO NOT stand on chairs, especially swivel or rolling chairs, to reach overhead storage. You'd be amazed how often people do this, or at least try. It seldom ends well. If you MUST climb, use the PROPER equipment.
    - Labs tend to get cluttered, which causes tripping. Keep your lab neat.
- OVEN FIRES
- Unpowered hand tools, including hammers, screwdrivers, files, sanding blocks, sandpaper etc.
- Machine and powered tools, including (but not limited to) drill presses, grinders, sanders, band and table saws, soldering guns and irons and all powered hand tools. There are precautions common to the use of all tools:
    - Wear proper eye protection (safety glasses, goggles, face shields) **AT ALL TIMES.**
    - Work in a fume hood, in a well-ventilated area, or wear appropriate respiratory protection.
    - Wear work gloves when appropriate. DO NOT wear gloves when operating spinning machinery such as saws, sanders and drill presses; if the glove is caught it may pull your hand into the tool!
    - Tie back loose long hair or wear a hat. Having your hair caught in a spinning machine can cause serious injury or death.
- "Sharps" (and the cuts they inflict):
    - DO NOT throw sharp objects in the trash! It endangers the custodial staff.
    - DO NOT throw razor blades, needles, broken glassware or anything sharp into lab drawers, desk drawers, pen holders, onto bookshelves or other ill-advised places. This FREQUENTLY causes serious lacerations or puncture wounds, if not to you, then to someone down the line.
    - Uncontaminated BROKEN GLASS should go into a Broken Glass Disposal box. These are available FREE from ORS, in the Fisher stockroom.
    - NEEDLES are a common source of injury, which is a concern if they are used on living organisms due to HIV, hepatitis and other pathogens. ORS has complete guidelines for use and disposal of needles and other sharps. Needles require special disposal containers.
    - Other UNCONTAMINATED sharps, such as scalpel and razor blades, should be put in proper sharps containers. These are also free in the VWR stockroom. When full, ORS will pick them up as lab waste.

9: Other Hazardous Equipment:

We use a large variety of equipment here in CEE, much of it not "scientific" in the classic sense. Many of these items can cause problems if mishandled.

- Pressurized equipment: It is not uncommon for experiments to involve vessels that contain gas or water pressure. Another serious accident in CEE involved rupture of a pressure vessel. Design and operation of such equipment MUST take safety into account; consult your PI and/or LC when using or planning to use such equipment.
- Tools, including hand tools, power tools and machine-shop tools: Use of these is by special arrangement with the "owner" of the tool.

- Centrifuges, especially very high-speed ones, can fail in a spectacular and devastating manner. Entire labs have been wrecked by exploding ultracentrifuges. All manufacturers instructions MUST be followed at ALL times. Again, the PI or LC responsible for the equipment must give permission for its use.
- The AUTOCLAVE: The autoclave in A261 belongs to the Environmental group. Misuse can be dangerous and can damage the autoclave. Use of the autoclave is by arrangement with the ENV Lab Coordinator. NO EXCEPTIONS.

10: Gas Cylinders:

Gas cylinders, regardless of their contents, are dangerous because:

- Large ones are very heavy; about 135 lbs when empty.
  If one tips over, you most likely will NOT be able to stop it from falling.
  Getting a hand caught between a moving cylinder and a solid object can cause serious injury.
  A falling cylinder can suffer critical valve damage, leading to catastrophic failure, flying cylinders, explosion and release of the contents.
- High-pressure vessels contain MASSIVE amounts of potential energy. A cylinder explosion will likely kill or maim anyone in the vicinity.
- If the contents are released, that is a LOT of the gas all at once. Even inert gasses like nitrogen can cause death by suffocation if a large amount is released in a small room.

Cylinder Safety Guidelines:

- ALL cylinders must be PROPERLY SECURED at all times. Ask your Lab Coordinator for assistance.
- When TRANSPORTING cylinders, use a cylinder cart and ALWAYS have the valve cap on.
- Not all regulators are compatible with all gasses; for instance, flammable gas regulators are NOT the same as air regulators. YOU must be sure of your equipment.

11: Biological Hazards:

There are two primary potential paths to exposure to pathogens or biogenic toxins that might occur during lab work:

- Accidental exposure to blood or other biological samples that might contain pathogens. This is referred to as "bloodborne pathogens" whether dealing with blood or another biological material.
- Exposure to organisms that you are working with.

ORS provides comprehensive guidelines for both these situations. Those researchers who plan on doing microbiological, serological or recombinant DNA work MUST read and understand the relevant documents, and tale all required training.

Bloodborne pathogens:

Northwestern ORS has a comprehensive set of safety guidelines dealing with the use of potentially infectious biological materials. You MUST read and understand these guidelines if you need to work with potentially infectious materials. Those working with sewage or contaminated water samples should strongly consider heeding these precautions as well.

Use and culture of microorganisms:

The extent of the safety precautions that a researcher needs to take depends upon the organism being used. CDC and NIH group microorganisms into "Biosafety Levels." These run from BSL-1 to BSL-4. BSL-4 is basically Andromeda Strain/The Stand/Ebola territory, so that is unlikely to be an issue.

You MUST KNOW the BSL into which your organism fits, and follow the guidelines for that BSL.

In addition, bioterrorism concerns have led to certain microorganisms (and biotoxins) being designated by the federal government as "SELECT AGENTS." If you plan to use, grow, acquire or ship any of these agents, CONTACT YOUR LAB COORDINATOR or ORS FIRST!

12: Safety Gear and Personal Protective Equipment (PPE):

In addition to common sense, good laboratory practice and prior planning, there is some standard lab equipment to prevent and deal with mishaps. You need to familiarize yourself with the location and proper use of your safety gear BEFORE YOU NEED IT!

Fire Extinguishers:

EVERY lab has a fire extinguisher. These are usually Type A-B-C dry chemical extinguishers. CO2 fire extinguishers are generally suitable for Class B and Class C fires. Fire extinguishers must be of the proper type for the fire you are fighting or you could well make the situation worse. Or be killed.

Class A: Common flammable solids like wood and paper.
Class B: Flammable liquids or gasses.
Class C: Fires involving POTENTIALLY LIVE ELECTRICAL EQUIPMENT.
Class D: Metal fires, such as sodium, lithium, magnesium. These require specialized extinguishers.
Class K: Liquid hydrocarbon fires, such as oil and gasoline. This is a special case of Class B.

You should be familiar with fire extinguisher classifications and proper use of them if you anticipate fighting a lab fire. NU Risk Management will provide fire extinguisher training at no cost at certain times of the year.

Fire extinguishers should be located near the exit, NOT where a fire is likely to start.

DO YOU KNOW WHERE THE FIRE EXTINGUISHER IS IN YOUR LAB?

Personal Protective Equipment (PPE):

This includes lab coats and other barrier garments, safety glasses or goggles, gloves, respiratory protection AND YOUR CLOTHING AND SHOES.

- Clothing is PPE! NO SHORTS OR OPEN SHOES IN LABS! A lot of common lab injuries can be

prevented or minimized merely by wearing proper clothing.

- Gloves: The use of PROPER gloves when handling many chemicals is extremely important. Not all glove materials will protect you from all chemicals; for instance, common latex gloves are useless against many organic solvents. ORS has a page of resources to help you choose the right glove for your needs.
- Eye Protection: Safety glasses or goggles are EXTREMELY important when working with chemicals, glassware, tools etc. There are actually very few instances where eye protection is NOT required in a lab. You must use APPROVED protective eyewear. Regular eyeglasses, even with impact-resistant lenses, lack side-shields and thus ARE NOT SAFETY GLASSES.
- Lab Coats: While not generally required, are generally a good idea. If used, they should be regularly exchanged for a clean one at ORS. DISPOSAL lab coats are an inexpensive and trouble-free alternative.
- Foot Protection: For most situations, standard CLOSED footwear will suffice. DO NOT wear sandals, open-toed shoes, flip-flops etc. In cases where heavy objects are moved, lifted, etc, consider discussing with your PI the purchasing of some sort of protective footwear.

This concludes the Guide to Safety and Compliance in CEE Labs.