CU Non-Lab Workers: General Lab Safety Awareness

The Office of CU Environmental Safety in Collaboration with CU Facilities and CU Research Safety
CU Non-Lab Workers: General Lab Safety Awareness

Outline:
• Universal Lab Door Signage
• Proper Attire and PPE
• Hazard Communication; Physical and Health Hazards
• Lab Signage; Lab Equipment; Lab Items
• Spill Response
• Summary
Universal Lab Door Signage:

Clemson University is implementing universal laboratory door signage on every lab door on campus.

- The Principal Investigator (PI) is the person that is in charge of the lab. The PI is responsible for completing and continually updating the required information on this sign.
- The next couple of slides will review the information provided by the lab door signage. It is crucial for non lab workers to understand the signage.
Lab Door Signage: Review of the Information Relayed

Tan box: List of Hazards

Red box: Emergency 911

Purple box: Location of MSDS/SDS

Green box: Research Safety Contact Info

Grey box: Entry Requirements (PPE, medical surveillance. No food/drink, etc.)

Striped grey and white lines located at the bottom of the sign: Lab Contact Info (!!!)
Lab Door Signage: Review of the Information Relayed

The lab room number and the date the sign was revised are located under the yellow box.

Symbols indicating if the lab has biohazards, radioactive materials, and/or lasers. These symbols will be reviewed in this presentation. Only those symbols that apply to a lab will appear on the sign, but the orientation of the 3 boxes will not change.

If it is a Biosafety lab, the level of the lab will be indicated as BL-1, or BL-2, and the agents will be listed. This terminology will be covered later in this presentation.
Universal Lab Door Signage: Entrance into a lab

The lab door signs implement a colored dot system. The colored dot is located in the upper right hand corner of the lab door sign. Other employees, such as the Custodial staff, use this colored dot system as well.

- The next slides will review this colored dot system.
Universal Lab Door Signage:

- For Custodial Staff, the colored dots apply to the Custodial Entrance as follows: **Green dot** = Custodial allowed to enter; **Yellow dot** = Custodial may enter with an escort only; **Red dot** = Custodial may NOT enter.

- The Entrance requirements for Non-Lab workers (such as Facilities, CCIT, and etc.) are different than as it applies to Custodial Staff. It is important for Non-lab workers to understand these signs, so this will be reviewed.
Lab Door Signage:
Notice, in the upper, right hand corner, there is a green dot.
Non-lab workers May Enter the Lab.

• The lab personnel contact information is located at the bottom of the sign.

• The Non-Lab worker is to contact lab personnel if any items need to be moved or if the lab area needs to be prepared for the work to safely begin.
Lab Door Signage:
Notice, in the upper, right hand corner, there is a yellow dot. **Non-Lab workers May Enter with Escort Only.**

- The lab personnel contact information is located at the bottom of the sign.
- The Non-Lab worker is to contact lab personnel if any items need to be moved or if the lab area needs to be prepared for the work to safely begin. Non-Lab workers **must** be escorted by lab personnel that has knowledge as to the hazards associated with the lab.
Lab Door Signage: Notice, in the upper, right hand corner, there is a red dot. Non-lab workers May Enter with Escort Only.

- The lab personnel contact information is located at the bottom of the sign.
- The Non-Lab worker is to contact lab personnel if any items need to be moved or if the lab area needs to be prepared for the work to safely begin. Non-Lab workers must be escorted by lab personnel that has knowledge as to the hazards associated with the lab.
Universal Lab Door Signage: Entrance for Maintenance Emergency

If an emergency situation were to occur, such as a leaking water pipe, the Non-lab worker must contact lab personnel that has knowledge of the hazards in the lab. This includes after working hours, weekends, holidays, etc. After relaying potential lab hazards, the lab personnel may grant entrance to a Non-lab worker so that the emergency maintenance situation can be halted or contained.

The lab contact information is located at the bottom of the lab door sign.

*This does not apply in case of Fire, Spills or other Exposure Safety Incidents.
Personal Protective Equipment = PPE

General dress code and PPE protects YOU from hazards and reduces YOUR risk of exposure!

This presentation will review...
The generally accepted dress code to enter *any* lab.
PPE selections that includes the consideration of both:

1. Lab hazards
2. Job hazards
Proper Attire to Enter Labs

In order for a Non-lab worker to enter a lab, he or she must wear the proper attire.

This includes **long pants** and **closed toe shoes**.

- Long pants may include jeans, khakis, dress slacks, Tyvek or a chemically resistant suit, etc.
- Closed toe shoes may include boots, tennis shoes, or departmental approved closed toe shoes.
Minimal Personal Protective Equipment (PPE) for a Non-Lab Worker to Enter a Lab

What to Wear to Enter a Lab:
Safety glasses are required for a Non-lab worker to enter a lab.

If there is any additional required PPE to enter a lab, the Non-lab worker must ask the Principal Investigator (PI - person in charge of the lab) where these items can be located in the lab. The lab will furnish any additional PPE that is required to enter a lab.

Additional PPE, may include a lab coat, safety goggles, gloves, etc.
Non-lab workers MUST wear the appropriate PPE based upon the job task or maintenance that is to be completed.

- Selection of this PPE must include the consideration of the hazardous products that will be used to complete the task, **AND** the handling of lab equipment and/or lab apparatuses (and if these items in the lab may be contaminated). The lab personnel is responsible to ensure a safe work environment.

Non-lab workers must follow the specific protocols as outlined in the job hazard assessments conducted by Environmental Safety (ES) or other departmental
Hazard Communication (Right To Know)

Under this OSHA Standard, it is not only required for Non-lab workers to meet the requirements, but ALL Laboratories must also abide by the guidelines in regards to SDS/MSDS, labeling of containers, and the 9 pictograms of hazard classes.

OSHA’s adoption of GHS, Globally Harmonized System, will effect:

- **Safety Data Sheets (SDS) and Material Safety Data Sheets (MSDS):** The lab personnel must have an MSDS or SDS available upon request. This is “Your Right To Know”.

- **Labeling:** At a minimum the label must include, the complete chemical identity (name); appropriate hazard warnings; name and address of the product manufacturer; legible and accurate as to what is in the container.

- **The 9 Pictograms of Hazard Classes:** Will be briefly reviewed in this presentation.
Right To Know: The 9 Pictograms and What They Mean

By 2015, all hazardous products will have the appropriate pictogram(s) on the original container. This presentation focuses on the containers that are found in the labs.

GHS is the OSHA adopted Globally Harmonized System.
Signs and Symbols in Labs

**Signs and Symbols:**
Flammable materials are materials that are easily ignited and capable of burning rapidly.

The red diamond below is the GHS symbol for flammables.

The symbols below are other variations for flammables. All variations include a flame or fire.
**Signs and Symbols:**
Oxidizing materials are materials that a fuel requires to burn, and it may cause an explosion or fire.

The red diamond below is the GHS symbol for oxidizing materials.

The symbols below are other variations for oxidizers. All variations include an “O” with a flame or fire.
**Signs and Symbols:**

Explosive materials is a chemical substance that undergoes rapid change (with production of gas) on being heated or struck.

The red diamond below is the GHS symbol for explosive materials.

The symbols below are other variations for explosives. All variations include an explosion with shrapnel and debris.
**Signs and Symbols:**
Corrosive materials are substances that can destroy and damage other substances with which it comes into contact. Corrosives can cause an immediate danger to what it comes in contact, such as skin or metal.

The red diamond below is the GHS symbol for corrosive materials.

The symbols below are other variations for corrosives. All variations include a substance that is damaging the surface of skin or metal.
Signs and Symbols:
Toxic materials means that the material is poisonous. This may not be an immediate danger, like corrosives, but it may take time for symptoms to develop. It can cause a serious medical condition or death.

The red diamond below is the GHS symbol for toxic materials.

The symbols below are other variations for toxics. All variations include a skull and cross bones.
Signs and Symbols:

Water Reactive materials are substances that when it comes in contact with water will catch fire or put off toxic fumes. **Do Not** use water around these chemicals.

This symbol is not found in the GHS table, but it is important to know and recognize. All variations illustrate a “W” with a line drawn through it.
**Laboratory Signage:**

In addition to the physical and health hazard symbols on containers, there are a variety of signs that will be observed in labs.
Biological Labs and Safety:
A Biological Lab may conduct research with plants, animal or human tissues.

- **Biosafety Level 1 (BSL 1 or BL 1):** These labs have organisms and tissues that are **not known to cause disease in healthy adult** humans and are of minimal potential hazard to lab personnel and the environment.

- **Biosafety Level 2 (BSL 2 or BL 2):** These labs may have organisms or tissues that pose a risk of disease or illness to humans by **direct contact** for Non-Lab workers. **Non-Lab workers MUST speak to the PI of any BL2 Lab before entering. Read the lab door sign!**
**Biological Labs and Biosafety:**

These signs do not indicate a BL 2 Lab, only that bio-hazardous materials are present in the lab. The variations of biological material hazard signs include one complete circle with 3 partial circles overlapping it.

Biohazard symbol as observed on CU lab door signs.
Biological Labs and Biosafety:
These items are for bio-hazardous waste.
Bio-hazardous waste containers may be lined with a red bag liner.

- Lab personnel are responsible for handling these items.
- Non-Lab workers do not touch or move them. In a maintenance emergency (after hours), chemical gloves must be worn in order to move these items.

Non-lab workers do not dispose of anything into bio-hazardous waste containers in the lab.
Biological Labs and Biosafety:

Bio-hazardous waste containers may also be lined with a clear bag liner that has the biohazard symbol on the liner. This clear liner with the biohazard symbol may come in a variety of sizes.

- Lab personnel are responsible for handling these items.
- Non-Lab workers do not touch or move them. In a maintenance emergency (after hours), chemical gloves must be worn in order to move these items.

Non-lab workers do not dispose of anything into bio-hazardous waste containers in the lab.
Biological Labs and Safety:

- Lab personnel are responsible for handling these items.
- Non-Lab workers do not touch or move them. In a maintenance emergency (after hours), chemical gloves must be worn in order to move these items.

Sharps containers with the biohazard symbols.

Sharps may include syringes or razors.

Non-lab workers do not dispose of anything into biohazard sharps containers in the lab.
Radioactive Materials and Radiation Safety

Radioactive Materials and Radsafety: Radiation is invisible energy that is created by various agents and machines. Examples include X-ray machines and radioactive materials.

- Radioactive material may be a solid, liquid, or gas that emit radiation. The degree of radioactivity varies greatly from every type of radioactive material. Even some common food, such as bananas and potatoes, are radioactive.

All variations of radiation or radioactive material symbol include a solid circle in the middle with 3 curved rays protruding from it.

Radioactive materials symbol as observed on CU lab door signs.
Radioactive Materials and Radiation Safety

**Radioactive Materials and Radsafety:**
Radioactive materials are disposed in yellow containers and/or yellow bags. These containers are labeled with the radioactive materials symbol.

- Lab personnel are responsible for handling these items.
- Non-Lab workers do **not** touch or move them. *In a maintenance emergency (after hours), chemical gloves must be worn in order to move these items.*

Non-lab workers do not dispose of anything into radioactive materials waste containers in the lab.
Radioactive Materials and Radiation Safety

Radioactive Materials and Radiosafety:
More examples of radioactive material yellow waste disposal containers and yellow liners.

- Lab personnel are responsible for handling these items.
- Non-Lab workers do not touch or move them. In a maintenance emergency (after hours), chemical gloves must be worn in order to move these items.

Non-lab workers do not dispose of anything into radioactive materials waste containers in the lab.
Lasers and Magnets:
A few labs on CU campus have Lasers and/or Magnets. Do **Not** enter when the laser is in use.

The three signs below: Lasers

The two signs below: Magnets

Laser symbol as observed on CU lab door signs.
What is Hazardous Waste?
Hazardous waste is waste that is dangerous or potentially harmful to our health or the environment. Hazardous wastes can be liquids, solids, gases, or sludges. They can be discarded products, like cleaning fluids or the by-products of research processes. These containers must be tightly closed unless lab workers are actively adding waste to the containers.

If it is a chemical that is ready for disposal, it must be disposed as a Hazardous Waste.

Non-lab workers do not dispose of anything into hazardous waste containers in the lab.
Hazardous Waste in Labs

Hazardous Waste Labels:
The white label is frequently used in labs, most often on small containers
Example: Chemical bottles
The yellow label is usually found on larger hazardous waste containers
Example: Drums
Hazardous Waste in Labs

**Properly labeled Hazardous Waste:**
A Hazardous Waste Label will include, in words, the chemical name and the hazards.

- Lab personnel are responsible for handling these items. Non-Lab workers do **not** touch or move them. *In a maintenance emergency (after hours), chemical gloves must be worn in order to move these items.*

Non-lab workers do not dispose of anything into hazardous waste containers in the lab.
Equipment in Labs

Lab equipment:
  Chemical Fume Hood.
  Biological Safety Cabinet (BSC).

Lab personnel must move the items in a chemical fume hood or a biological safety cabinet and prepare the area! The Lab PI is to ensure that it is safe for work to begin by the Non-lab worker.
**Lab equipment:**
Examples of storage cabinets that may be found in labs.

The two cabinets below are used for flammable materials storage.

The two, blue cabinets below are used for corrosive materials storage.
Trash Cans and Liners

In the Labs:
Acceptable general, *non-contaminated* trash cans and liners. These containers will be lined with black or clear liners without any writing or symbols on them.
If Non-lab workers do not use a product in its entirety for a job task, the container is **Not** to be left in the lab. All products, materials, and tools must be removed from the lab by the Non-lab worker.

- If a Non-lab worker has used all of a product, resulting in an **EMPTY** container, that container must be properly disposed. Labels *must* be defaced or removed.
- Empty chemical containers with labels intact are **Not** disposed of in general, non-contaminated trash.
In the Labs:
Non-Lab workers do **Not** place any items in the broken glass box in a lab. Certain items cannot be placed in this box: mercury thermometers, contaminated glassware/vials, samples, electrical wire, liquids, etc.

- Lab personnel are responsible for properly disposing of the broken glass box and he or she must be certain that it does not contain anything that is contaminated. *In an maintenance emergency (after hours), chemical gloves must be worn in order to move these items.*

Non-lab workers do not dispose of anything into the broken glass box in the lab.
Before Leaving the Lab... **Wash Your Hands!**

- Before exiting the lab, immediately wash your hands - even if it is believed that your hands have not been contaminated.
- This is an excellent method for infection control and preventing cross-contamination at work.
Emergency Drench Equipment: 
Locate prior to starting work!
Safety showers: Use in case of contact with hazardous chemicals, chemical compounds, or fire.

- Affected areas should be flushed with water As Soon As Possible and for a minimum of 15 minutes. Contaminated clothing should be removed as soon as the shower is activated.
- Seek medical attention as needed and follow CU policy and guidelines for incident reporting.
Emergency Drench Equipment:  
Locate prior to starting work!

Eye Wash: Use in case of contact with hazardous chemicals, chemical compounds, or fire to face or eyes.

- Affected areas should be flushed with water As Soon As Possible and for a minimum of 15 minutes.
- Seek medical attention as needed and follow CU policy and guidelines for incident reporting.
Spill Incident Response

- Clemson University Fire Department responds to spills for main campus.
- In the event of a spill or fire, contact CUFD by dialing: 911 or 656-2222.
Summary of Non-Lab Workers Responsibilities when working in a lab

- Review the Universal Lab Door Sign for all relayed information:
  Enter with proper attire and PPE.
  Enter as outlined on the lab sign door.
  Green dot=enter; Yellow or Red dot= enter with escort
- Notify lab personnel with any concerns (spills, hazards, etc.).
- Do not hesitate to ask questions. Review all lab signage and ask lab personnel about potential hazards.
- Identify and locate the nearest safety shower and eye wash.
- Wear proper PPE for the job task at hand.
- Remove all materials, tools, and products used for the job task. Do not leave anything in the lab.
- Wash hands before leaving the lab.
All Labs have rules and regulations that they must follow.

- OSHA’s Laboratory Standard 29 CFR 1910.1450
- The South Carolina Department of Health and Environmental Control (DHEC)
- Both the U.S. EPA and SC DHEC regulate the disposal of chemical wastes.
The Office of Environmental Safety provides training in the following areas:
Hazard Communication
Bloodborne Pathogens
General Lab Safety for Custodians
General Lab Safety for Facilities Maintenance
Safety Data Sheets
SPCC and Storm Water (MS4)
Asbestos
Ladder and Scaffold
Confined Space
Chemical Fume Hoods
Forklifts

The Office of Research Safety provides online training in the following areas:
Biological Safety
Biological Safety Cabinets
Bloodborne Pathogens for lab workers
Chemical Hygiene
Hazard Communication for lab workers
Hazardous Waste Management
Laser Safety
Safety Data Sheets for lab workers