Laboratory Safety Training

VA Portland Health Care System
Research and Development Service

Laboratory Safety Training: Introduction

Overview

Welcome to the VAPORHCS (VA Portland Health Care System) R&D Laboratory Safety Training. Please read through this entire training. Once you have completed all of the sections, there will be a short test for you to complete.

If you have any questions during the course of this training, please reach out to your Research supervisor, or the SRS Coordinator for clarification.

Laboratory Safety Training: Introduction

Overview

The following safety topics will be discussed in this training:

- Introduction
  - Overview
  - Implementation of Research Safety Program
  - Research Safety Resources
  - Required Postings in the Laboratory
  - General Dos and Don’ts
- Physical Safety
  - General Physical Safety Topics
  - Personal Protective Equipment (PPE)
  - Safety Equipment
  - Fire Safety

Laboratory Safety Training: Introduction

Overview

The following safety topics will be discussed in this training, continued:

- Hazardous Materials
  - Biohazardous Materials Safety
  - Select Agents and Toxins
  - Disposal of Biohazardous Waste
  - Chemical Safety
  - Safety Data Sheets
  - Information Found on Safety Data Sheets
  - Chemical Inventory
  - Disposal of Chemical Waste
- Hazardous Spills
  - Spill Response
  - R.I.N.S.E.
- Closing
  - Laboratory Show and Tell

Laboratory Safety Training: Introduction

Overview

The VAPORHCS R&D Safety Program adheres to the guidelines described in **VHA Handbook 1200.08, Safety of Personnel and Security of Laboratories Engaged in VA Research**. This program mandates that:

- All research activities must undergo annual safety reviews by the Subcommittee on Research Safety (SRS).
- All research activities must be conducted in a manner that ensures the security of hazardous or potentially hazardous research materials.
- All research personnel must undergo annual safety training that covers both general and research-specific activities.
- All research laboratories must be inspected semi-annually by general safety and laboratory safety specialists.
- All research projects and proposals must be reviewed by the SRS and the R&D Committee.

Laboratory Safety Training: Introduction

Implementation of the Research Safety Program

- The **VAPORHCS SRS** and **R&D Committee** are responsible for communicating research safety guidelines to Research Service personnel.
- The **Principal Investigator** is responsible for ensuring that assigned research laboratories and laboratory research personnel comply with these research safety guidelines, regardless of funding support or source.
- The **Principal Investigator** is also responsible for ensuring that research personnel receive appropriate safety training with respect to lab-specific research activities.

Laboratory Safety Training: Introduction

Research Safety Resources

All research personnel **must** be familiar with the information contained in, and the location of, the following manuals:

- The **Chemical Hygiene Plan**
  - A clearly-labeled binder that must be maintained in every research ("wet") laboratory.
- The **VAPORHCS Biosafety Manual**
  - This manual must also be maintained in every "wet" lab. It can be co-located with the Chemical Hygiene Plan.
- The **Research Emergency Plan**
  - A yellow, 3-ring binder located in a common or break room in your research area.

Laboratory Safety Training: Introduction

Required Postings in The Laboratory

The following information should be posted in or near each lab:

- The Emergency Response flip chart (available by calling x56317).
- A list of phone numbers for reporting fire (*20), hazardous spill (*20), and medical (*22) emergencies.

Laboratory Safety Training: Introduction

Required Postings in The Laboratory

Depending on the materials that are used or stored in a room, the following may also need to be posted:

- Radioactive materials
  - The NRC Form 3 (version 8-17, “Notice to Employees”) regarding use of radioactive materials
  - An NHPP Green Card.
- Agents handled at a BSL-2 level
  - The BSL-2 SOP for spill response
  - General disinfection practices for these biohazardous agents.
- A sign posted on the lab door noting any BSL-1 or BSL-2 biohazards used in the room
  - Form available from Biosafety Officer or last page of VAPORHCS Biosafety Manual

Laboratory Safety Training: Introduction

General Dos and Don’ts

Do:

- Wear appropriate Personal Protective Equipment (PPE) - goggles, gloves, lab coat, etc.
- Refer to Safety Data Sheets (SDS) for info on hazardous chemicals.
- Ask your supervisor or the SRS Coordinator when unsure of how to handle or dispose of hazardous materials.

Don’t:

- Eat, drink, apply makeup, or insert contact lenses while in areas where hazardous materials are used or stored.
- Use a chemical, biological, or radiological agent if you don't know its potential hazards.
- Discard hazardous materials in the general waste stream.

Laboratory Safety Training: Physical Safety

General Physical Safety

A biomedical research laboratory presents a variety of physical hazards that can be minimized by using good laboratory practice and common sense, by staying alert, and by always thinking about where potential hazards may exist.

Laboratory Safety Training: Physical Safety

General Physical Safety

- Keep floors dry and uncluttered to prevent slips and falls.
- Whenever possible, open flames should be replaced by hot plates, safety Bunsen burners (e.g., a Fireboy), or pre-sterilized disposable instruments.
- Never use personal space heaters for labs or offices.
- Never use electrical extension cords, unless pre-approved by FMS.
- Compressed gas cylinders must always be secured with both upper and lower restraining straps.
- When not in use, outlet nozzles on compressed gas cylinders should be covered with metal caps.

Laboratory Safety Training: Physical Safety

General Physical Safety

- **High voltage equipment**
  When using high voltage equipment such as electrophoresis units, be sure that the power is off before you start making connections. Handle power leads one at a time, and beware of loose connections that could allow sparks or electrical arcing. Keep the equipment away from a sink or wet area. And, if you feel a tingle when you touch the unit, immediately stop using it until it is repaired.
- **Microwave ovens**
  Microwave ovens can be dangerous pieces of equipment when not used properly. Capped containers can explode. Superheating of liquids can occur. Inappropriate plastic containers can melt.

Laboratory Safety Training: Physical Safety

General Physical Safety

- **Autoclaves**
  Steam, heat, and pressure are the principal physical hazards associated with using autoclaves. Improper use of autoclaves can result in significant personal injury from exposure to steam, scalding liquids, and shattering glassware. Review the autoclave manufacturer's operating manual for specific use instructions and always have an experienced colleague instruct you in proper use of an autoclave.
- **Centrifuges**
  Most centrifuge-related failures are due to user error. Careless centrifugation can mean lost samples or damaged equipment, and also presents a risk to the user and the lab. Again, review the centrifuge manufacturer's operating manual for specific use instructions.

Laboratory Safety Training: Physical Safety

Personal Protection Equipment (PPE)

PPE represent an important line of defense for lab safety. Protect yourself by wearing a **lab coat, gloves, eye protection, and masks or respirators** as needed for each experimental procedure. Don't simply rely on chemical fume hoods or biological safety cabinets for optimal protection.

Laboratory Safety Training: Physical Safety

Personal Protection Equipment (PPE)

- **Gloves:**
  - Choose the right gloves. You should know the characteristics of the different glove types and understand the hazards of the chemicals or materials being used.
  - No glove material is impermeable to all chemicals. The most effective practice in using protective gloves is to change them frequently and whenever they are contaminated.
  - Always wash your hands thoroughly with soap and water when changing into fresh gloves and after working with any hazardous substances.
  - Regularly check the expiration date on boxes of gloves. Old gloves become brittle, develop tiny holes, and provide decreased protection.

Laboratory Safety Training: Physical Safety

Personal Protection Equipment (PPE)

Masks and Respirators

- **Surgical masks** are primarily a barrier against droplets, splashes, and larger particulate matter. They are the simplest form of protecting the nose and mouth, and are commonly used for animal procedures, weighing toxic powders, and when using any hazardous material that may splash.
- **N95 and N100 respirators** protect against finer particulate matter, including airborne infectious agents, but do not protect against chemical vapors. These can only be used after medical clearance and a fit test by GEMS personnel.
- **Cartridge or air-purifying respirators** are used when a fume hood is unavailable or inadequate to control chemical vapors. Contact the Industrial Hygienist for selection and fit.

Laboratory Safety Training: Physical Safety

Personal Protection Equipment (PPE)

Always protect your eyes

Safety glasses, splash goggles, and full-face shields offer varying degrees of protection against splattering chemicals and airborne objects.

Laboratory Safety Training: Physical Safety

Personal Protection Equipment (PPE)

- **Safety Glasses**: Choose safety glasses with side eye shields when there is a splash hazard with a small quantity of a hazardous material (e.g., when opening a liquid chemical bottle or popping open a microcentrifuge tube containing biohazardous material).
- **Goggles**: Wear goggles when handling chemicals that are highly caustic or in large volumes (e.g., greater than one liter).
- **Face Shields**: Wear a face shield when you are handling large volumes of a hazardous chemical, or when you need to protect your face and your eyes. For example, wear a face shield when you are removing a closed container from liquid nitrogen or working at an ultraviolet light transilluminator.

Laboratory Safety Training: Physical Safety

Safety Equipment

Eye Wash Stations

Eye injuries represent one of the most serious injuries that can occur in the laboratory. All research personnel should be familiar with the location and proper operation of the eye wash station.

- The eyewash station must be checked (i.e., inspected, flushed and recorded) **every week** by laboratory personnel.
- Do not block the eyewash stations with dirty glassware, reagent containers, etc.
- **Remember: you should be able to reach and operate the eyewash station in your area within 10 seconds from anywhere in the lab with your eyes closed!**

Laboratory Safety Training: Physical Safety

Safety Equipment

Emergency Showers

- Emergency showers are used for larger spills affecting the whole body. These showers are located in the corridors and in a few labs within the research areas.
- Familiarize yourself with the location and proper operation of these units, and never block them with carts, chairs, or other objects.
- Maintenance and inspection of the emergency showers is performed by FMS.

Laboratory Safety Training: Physical Safety

Safety Equipment

Chemical Fume Hoods

- The chemical fume hood protects you from exposure to chemical fumes, gases, and aerosols that are generated within the enclosure. Protection is provided by room air that is drawn into the hood and vented to the atmosphere.
- Chemical fume hoods **do not provide protection against infectious agents.** These should be used in a biosafety cabinet.
- The hood should always be on. Notify the Research Office staff, FMS, or the GEMS Office immediately if the hood is not functioning properly.
- All chemical hoods are inspected and certified annually by FMS.

Laboratory Safety Training: Physical Safety

Safety Equipment

Chemical Fume Hoods (cont.)

- Safe operation of the chemical hood depends on the proper sash height, the airfoil sill (front lip) clearance, and the internal exhaust vents and fan. Always maintain a clear perimeter within the fume hood cabinet: 6 inches from the airfoil sill and 2 inches from the sides and back (exhaust sill).
- The interiors of the chemical hoods should not be used for storage of materials, reagents, or equipment. Equipment items placed within the chemical hood may need to be elevated (on "legs" or "stilts") to allow proper air flow.
- Placing the sash at the lowest level for convenient operation will provide the best protection.

Laboratory Safety Training: Physical Safety

Safety Equipment

Chemical Fume Hoods (cont.)

- Room air drafts, rapid hand movements into and out of the hood, and obstructions at the airfoil or within the cabinet can compromise hood performance. Even a small disturbance near the hood, like someone closing a door or walking by, can create drafts that cause vapor to escape from the hood.

- When planning an experiment with hazardous chemicals, you should ask your colleagues to reduce activities such as walking past the hood or opening and closing the lab doors while you are working.

Laboratory Safety Training: Physical Safety

Safety Equipment

The Biosafety Cabinet

- The biosafety cabinets ("tissue culture hoods") in use in VAPORHCS research labs provide two-way safeguards from biohazardous agents by:
  1. protecting the worker from the cell or tissue samples, which may contain an infectious agent, and
  2. protecting the cell or tissue cultures from agents outside the cabinet that could contaminate the culture and ruin an experiment.
- Biosafety cabinets **do not provide protection against chemical fumes**. Chemicals that produce a toxic vapor must be used in a chemical fume hood.

Laboratory Safety Training: Physical Safety

Safety Equipment

The Biosafety Cabinet (cont.)

- Biosafety cabinets work through a combination of directed airflow and filtration of small particles, including infectious agents, by high efficiency particulate air (HEPA) filters. HEPA filters also treat the cabinet's exhaust air.
- As with fume hoods, proper sash height and airflow are critical elements for safe operation of biosafety cabinets. Do not store excess items in the cabinet or block vents at front or rear. Minimize movements in and out of the cabinet to prevent excess disruption of the airflow.
- All biosafety cabinets are inspected and certified annually by FMS. This includes any necessary HEPA filter changes.

Laboratory Safety Training: Physical Safety

Fire Safety

Fire is the most potentially devastating emergency in the research laboratory. It is imperative that you know how to prevent fires and how to respond should a fire occur:

- Know the location of the nearest fire extinguisher.
- Know the R-A-C-E procedure (Rescue, Alarm, Contain, Extinguish/Evacuate).
- Ensure the lab aisles and evacuation routes are free of equipment and other objects that could obstruct safe passage.
  - All interior lab corridors must maintain 30” of clearance.
  - All hallway corridors must maintain 36” of clearance.
  - Remember: safe passage is for your benefit and for the benefit of emergency responders.
- Observe the 18-inch clearance rule for all overhead storage.

Laboratory Safety Training: Physical Safety

Fire Safety

Use of flammable reagents is the primary cause of lab fires. Always follow these prudent practices:

- Working solutions of flammable reagents should be limited to small quantities (e.g., the volume to be used daily).
- Larger stock solutions of flammable chemicals must be stored in a flammables cabinet. If flammable chemicals require cold storage, store only in refrigerators approved for such use or in a flammables cabinet in the cold room.
- Always separate flammable reagents from sources of ignition. For example, never use a Bunsen burner in any area where flammable reagents are handled.
- Use hot plates rather than Bunsen burners when heating solutions.

Laboratory Safety Training: Hazardous Materials

Hazardous Materials Safety

Hazardous Materials are biological, chemical, or radioactive substances that are potentially dangerous to your health and safety. Be sure you are properly trained before using a hazardous agent for the first time! Ask for help from the lab director or a more experienced colleague and read any warning statements from manufacturers that might accompany the material.

Individuals working with radioactive materials are required to take a separate radiation safety training module, found on the R&D website.

Laboratory Safety Training: Hazardous Materials

Biohazardous Materials Safety

- A biohazardous material is any biologically-derived substance, including cells, tissues, fluids, toxins, or microorganisms, that can potentially cause infection or (in the case of toxins) infection-like symptoms in humans or other animals.
- Detailed information regarding the required practices for work with biological agents and toxins, including PPE, disinfection protocols, and shipping of infectious materials, is outlined in the VAPORHCS Biosafety Manual. A copy of this manual has been provided to each laboratory, and lab staff must be familiar with its contents.
- All investigators must verify, with assistance from the VA Research Biosafety Officer and the Subcommittee on Research Safety, that their research with biological pathogens, agents and toxins complies with the procedures in this manual.

Laboratory Safety Training: Hazardous Materials

Biohazardous Materials Safety

- Lab conditions for handling biohazardous agents are designated by a “Biosafety Level” (BSL) between 1 and 4. The BSL determines the equipment, PPE, and experimental practices needed to protect workers from infectious agents and to prevent the spread of an agent outside of a designated lab space.
- The physical design of the wet laboratories at VAPORHCS complies with BSL-2 containment. A secured BSL-3 facility is available for work with higher-risk pathogens and agents. BSL-4 work is not permitted at VAPORHCS.

Laboratory Safety Training: Hazardous Materials

Biohazardous Materials Safety

- BSL-1 handling is used for work with biologically-derived material that poses limited infection risk to humans. An example would be handling of tissues from lab rodents not known to be infected with a pathogen. No special barrier or equipment is generally needed, and PPE usually consists of gloves, lab coat or gown, plus eye protection and a surgical mask if a splash hazard exists.

Laboratory Safety Training: Hazardous Materials

Biohazardous Materials Safety

- BSL-2 handling is used with moderate-risk agents derived from human or non-human primate (NHP) sources, including most biospecimens from human research subjects and human- or NHP-derived cell lines (note that some specimens require higher containment, depending on presence of known pathogens). BSL-2 handling is also used with many microorganisms and viral-based gene expression vectors.
- Work must be conducted in a biosafety cabinet whenever possible, particularly for any activity that may generate an aerosol such as vortexing, pipetting, or shaking.
- Samples to be centrifuged must be in tightly-closed containers.
- PPE required for BSL-2 handling consists of gloves, lab coat or gown, plus eye protection and a surgical mask if a splash hazard exists.

Laboratory Safety Training: Hazardous Materials

Biohazardous Materials Safety

- BSL-3 handling is used for work with infectious agents or toxins that can be transmitted through the air and can cause serious or potentially lethal infections. Work at BSL-3 level must be approved by the SRS and BSL-3 Director: reach out to the SRS Coordinator with any questions.

- BSL-4 handling is used for work with infectious agents or toxins that pose a high risk of aerosol-transmitted infection which cause serious or life-threatening disease for which no vaccine or therapy is available. BSL-4 work is not permitted at VAPORHCS.

Laboratory Safety Training: Hazardous Materials

Biohazardous Materials Safety

- When handling biomaterials at BSL-2, the primary risks are sharps injuries, mucous membrane exposures (e.g., a splash in the eye) and accidental ingestion of infectious materials.
- No cell line or tissue sample, even from a commercial vendor, is guaranteed to be non-hazardous. While some vendors do conduct pathogen testing, generally this is done with a limited panel of common pathogens.
- When working with mammalian blood, tissues or cell lines, particularly of human or NHP origin, always assume that infectious agents may be present!

Laboratory Safety Training: Hazardous Materials

Select Agents and Toxins

Select agents and toxins are a subset of biohazardous materials that the Department of Health and Human Services (HHS) and USDA have determined to have the potential to pose a severe threat to public health and safety, to animal or plant health, or to animal or plant products. Possession and use of select agents and toxins is regulated by 42 CFR 73,
9 CFR 121, and 7 CFR 331.3.

The current list of these agents can be found here:
http://www.selectagents.gov/SelectAgentsandToxinsList.html

Laboratory Safety Training: Hazardous Materials

Select Agents and Toxins

- All investigators should review this list, as individuals possessing or using any of the agents on the list **may require registration** with the CDC and the Veterans Health Administration Office of Research and Development (ORD), depending on the quantity of material to be stored in the lab.
- Any investigator who wishes to conduct work with a Select Agent or Toxin should first contact the SRS for help with necessary approvals.
- Possession or use of these agents without previous approval from the required agencies may be subject to penalties such as fines and/or imprisonment.

Laboratory Safety Training: Hazardous Materials

Disposal of Biohazardous Waste

- All biologically-derived waste should be discarded in red bags and bins as potentially biohazardous. Biohazard bins, including red sharps containers, should always remain closed as much as possible when not in active use.
- Red bags and sharps containers must be discarded when ¾ full by transporting to the designated disposal areas on each floor.
- Benchtops, centrifuges, and biosafety cabinets must be disinfected after use with an appropriate agent. See the VAPORHCS Biosafety Manual for a disinfectant chart.
- Uncontaminated waste, such as clean packaging from tissue culture plastics or paper towels used to dry hands after washing, should be discarded in regular trash, not biohazard bins.

Laboratory Safety Training: Hazardous Materials

Chemical Safety

Chemical manufacturers are required to label containers with one or more of the following symbols, if the chemical is hazardous:

Explosive

Flammable

Corrosive

Acutely Toxic

Health hazard (Longer term, e.g. carcinogen, mutagen)

Irritant

Gas Under Pressure

Toxic to Environment

Laboratory Safety Training: Hazardous Materials

Safety Data Sheets

- Safety Data Sheets (SDS, formerly MSDS) are documents providing information related to hazardous chemicals or chemical compounds.
- Manufacturers and importers must provide an SDS for each hazardous chemical they produce or import.
- Employers must have an SDS in the workplace for each hazardous chemical or compound they use (29 CFR 1910.1200(g)).
- These sheets are maintained by each lab online using the SDS/Chemical Inventory Service. Email our Industrial Hygienist Matt Walter (matthew.walter@va.gov) or call x54765 for questions about this database.

Laboratory Safety Training: Hazardous Materials

Information Found on the SDS

- Name and address of manufacturer, as well as an emergency contact number
- Name of chemical, listed as percentage of total content
- CAS Number (a number unique to that chemical)
- The chemical's physical characteristics, including stability/reactivity
- PPE to use when handling the chemical
- Occupational Safety & Health Administration (OSHA) permissible exposure limits, if any

Laboratory Safety Training: Hazardous Materials

Information Found on the SDS

- Hazards identification such as:
  - One of two “signal" words:
    - “Warning” is used for less severe hazards
    - “Danger” is used for more severe hazards
  - Hazard classifications (e.g., flammable, corrosive)
  - Any hazard statements, such as “Heating may cause an explosion” or “Causes serious eye irritation.”

Laboratory Safety Training: Hazardous Materials

Information Found on the SDS

Health Hazard Information on the SDS

- Common routes of entry
- Nature of health hazards
  - Acute
  - Chronic
- Medical conditions aggravated by exposure
- Carcinogenicity
- Signs/symptoms of overexposure
- Other precautions
- Emergency/first aid

Laboratory Safety Training: Hazardous Materials

Information Found on the SDS

- Storage requirements, including chemical incompatibilities
- Ventilation requirements
- Spill response procedures
- Type of extinguishing agent to use in case of fire
- Waste disposal procedures
- Shipping and transportation requirements

Laboratory Safety Training: Hazardous Materials

Chemical Inventory

- As the repository for all Safety Data Sheets for each lab, the SDS/Chemical Inventory Service also serves as the inventory of all hazardous chemicals at VAPORHCS.
  - Each laboratory is responsible for continuously updating their hazardous chemical inventory in this system.
  - Every 6 months, when requested by the GEMS office, laboratories must make final updates and then report that their inventory is complete.

Laboratory Safety Training: Hazardous Materials

Disposal of Chemical Waste

- VA research personnel must comply with strict federal and state Department of Environmental Quality (DEQ) guidelines that regulate waste streams generated at this medical center.
- When in doubt, always consult the GEMS Manager at x51726 for proper procedures for disposal of hazardous chemical waste.

Laboratory Safety Training: Hazardous Materials

Disposal of Chemical Waste

- **All** solid and liquid chemical waste (even non-hazardous waste) stored in laboratories must be **appropriately labeled** with contents and hazards and stored in **closed** containers.
- Hazardous waste must be labeled with the words "Hazardous Waste", the room number, contents with principle hazards (e.g., flammable, corrosive, etc.), and accumulation start date
- Call the GEMS office at x51726, or the SRS Coordinator, for orange labels to use for waste containers.
- Lack of proper labeling and storage of chemical waste has resulted in monetary fines against this medical center by state DEQ inspectors in the past.
- **The safest policy for non-hazardous waste:** immediately discard the waste after it is generated, or label it as non-hazardous.

Laboratory Safety Training: Hazardous Materials

Disposal of Chemical Waste

- Segregate waste bottles according to hazards using the same rules as for the original stock bottles (e.g., corrosives and flammables separated).
- Store liquid waste in a **secondary container**. The secondary container should be an impermeable material (e.g., a plastic tub) and large enough to hold the contents of the largest bottle placed inside, without overflow or leaking.
- All bottles kept in the same secondary container should be chemically compatible (e.g., acids and bases not stored together).
- Waste pickup is every Wednesday. To schedule a pickup, call x51726.
  - Schedule regular pick-ups for chemical waste!

Laboratory Safety Training: Hazardous Spills

Spill Response

- All spills must be reported by calling *20.
- Make a quick initial assessment of the spill. Determine whether a significant hazard exists by looking for any of the following signs:
  - Injured or ailing personnel
  - Symptoms or signs of severe irritation reported by personnel in the area(s)
  - Evidence of a large-volume spill
  - Known carcinogens involved in the spill
  - Presence of very strong odors beyond the immediate area

Laboratory Safety Training: Hazardous Spills

Spill Response

If none of these signs of a significant spill exist, proceed with clean up:

- Spill buckets containing instructions and spill response materials are available throughout the halls in Research areas.
- Wearing all PPE appropriate to handling of the spilled material, wipe up material and place it in either a container with a tightly-fitting lid or in a closed Ziploc bag.
- Label the outside of the container or bag clearly.
- Contact Ext. 51726 for a hazardous waste pickup.

Laboratory Safety Training: Hazardous Spills

R.I.N.S.E.

- In the case of a hazardous materials spill, remember the acronym R.I.N.S.E.
  - Rescue
  - Incident Command
  - Notify
  - Suppress/Confine
  - Evacuate

Laboratory Safety Training: Hazardous Spills

R.I.N.S.E.

R = Rescue

- Rescue personnel
- DO NOT attempt a rescue that puts you or others at further risk.

I = Incident Command

- Offer spill victims first aid, emergency showering and/or eye washing, and perform the critical functions that follow.

Laboratory Safety Training: Hazardous Spills

R.I.N.S.E.

N = Notify

Call *20 and provide the following details:

- What chemical spilled?
- How much?
- Where?
- Any injuries?

Laboratory Safety Training: Hazardous Spills

R.I.N.S.E.

S = Suppress/Confine

- Confine the spill as much as possible. Know the location of spill kits in hallways.

E = Evacuate

- Alert all personnel to leave the spill area.

Laboratory Safety Training: Closing

Laboratory Show & Tell

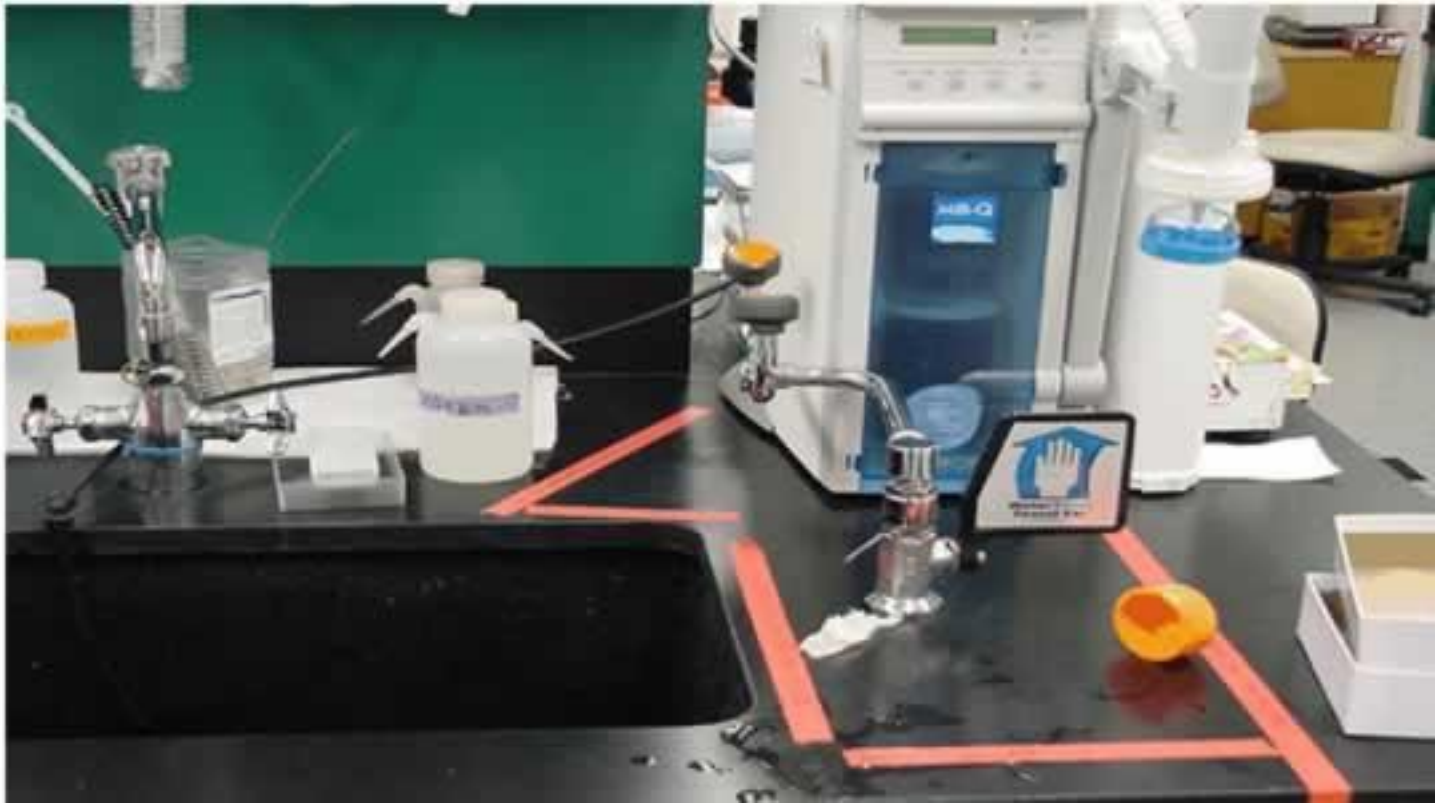
The pictures and text on the following pages provide further examples of what to do - and what not to do - in the scientific research laboratory.

Tanks must be properly secured with both top and bottom straps. When tanks are not in use, regulators must be topped with metal caps.

Gas flow regulators should not be attached when tanks are not in use.

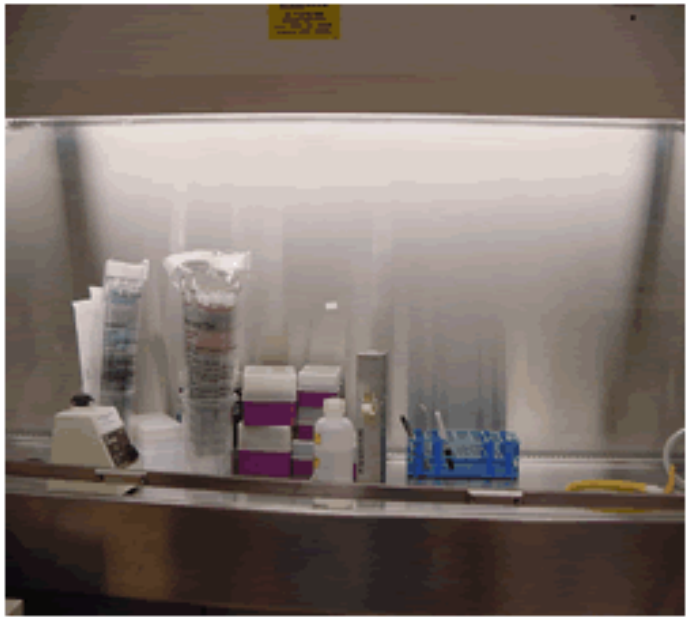
Eye wash stations must be checked (flushed) **every week**.
The inspection date must be recorded and signed.

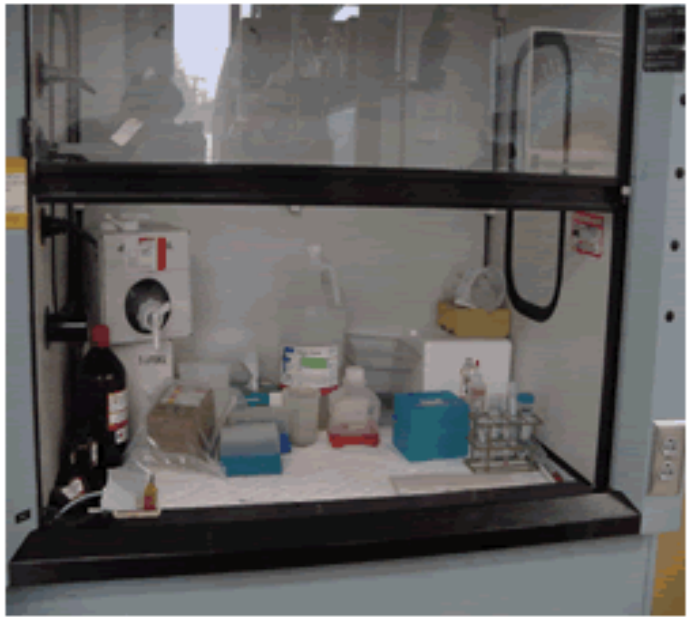
Access to eye wash stations must not be blocked.



Tape off areas of the lab bench that must remain clear - and keep them clear.

Keep laboratory corridors open and uncluttered.





Clutter in biological safety cabinets and chemical fume hoods will compromise their proper functioning.

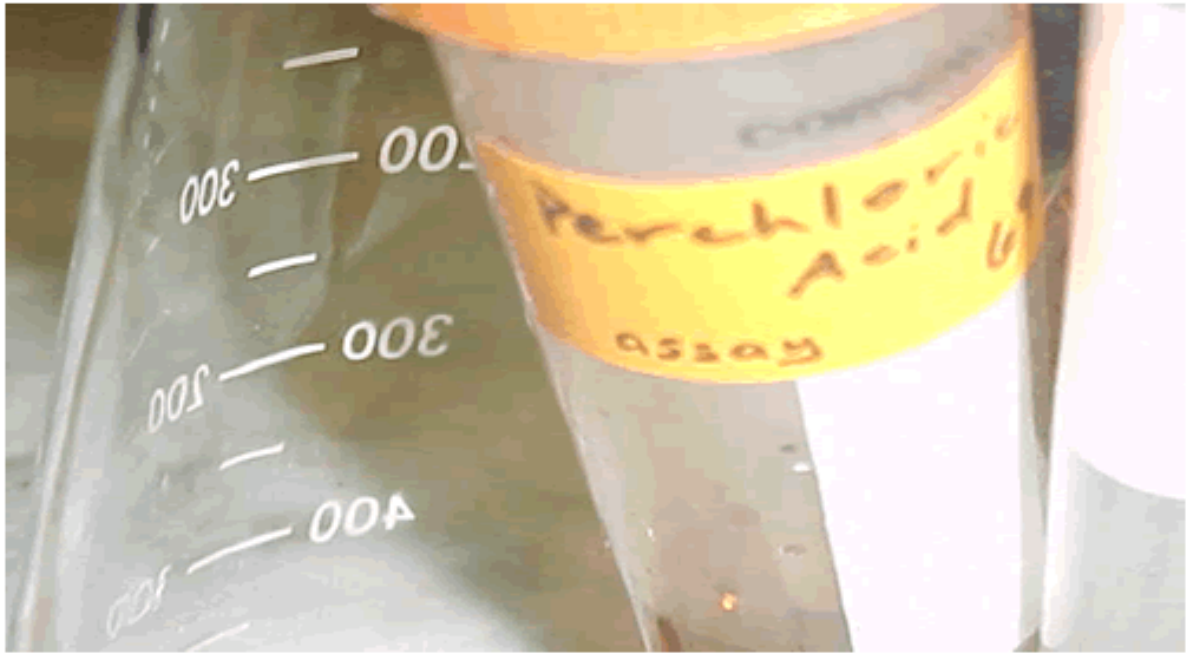
Label waste containers with chemical name and hazard type (e.g., irritant, flammable). Seal waste containers with a tightly-fitted lid, not aluminum foil or plastic wrap.

Nice hazardous waste labeling!

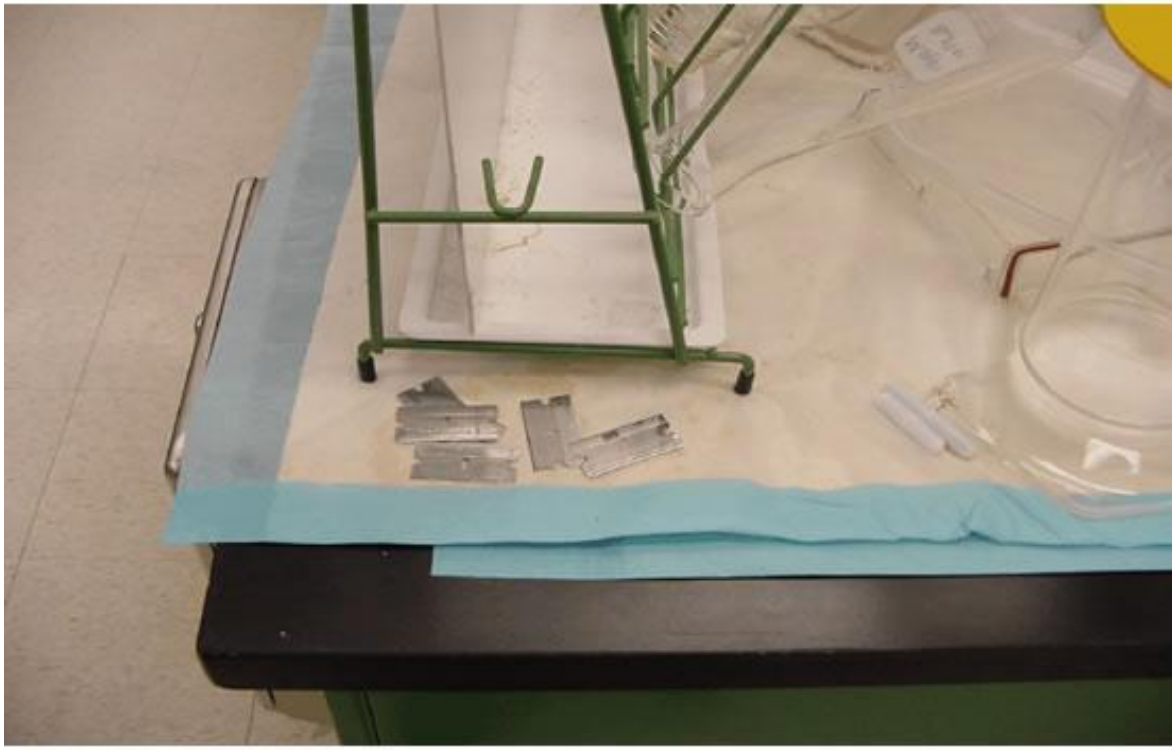
Funnels may be left in waste containers ONLY if tightly inserted into small hole in waste container lid and sealed at top of funnel when not in use.

Working solutions must be labeled with the hazard (e.g., "flammable", "irritant", or “non-hazardous”), not just the chemical name.

Be aware of containers that are rusted, moldy, or past their shelf life. These should be discarded if at all possible.



The use of perchloric acid is not allowed at VAPORHCS.



All sharps (needles, broken glass, razor blades, etc.) must be discarded in designated and secured "sharps" containers.

Hazardous waste containers must not be overfilled.

Take all spills seriously and handle them properly!

You have now completed the Laboratory Safety Training.

Click here to take the Post-Test