Lab Safety for Non-Lab Workers

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Purpose

This document provides essential safety information for employees who may need to enter or work near laboratories but are not laboratory staff nor familiar with the associated hazards.

The goal is to:

- Increase awareness of potential hazards in laboratories
- Clarify the use of Personal Protective Equipment (PPE)
- Outline emergency procedures
- Provide information on relevant Ontario regulations that identify the need to control, monitor and record entry to certain labs
- Clarify the intent of "restricted access"

What does "restricted access mean?

In some cases, laboratories may have restricted access for various reasons. Although some groups, such as security, facilities, custodial and other staff members may be able to open doors using a master key or swipe card, restrictions to this access may be in place.

All service groups may access restricted labs with the permission of individual(s) noted on lab signage. For Emergency or Urgent Event Situations see section 11.

Contractor Access: must be accompanied by a staff member who reviews protocols and provides access

Facilities Staff: as requested per service ticket. Follow lab contact protocols as posted. For emergency situations, see below.

Security Access: as requested or neccessary. Follow lab contact protocols as posted. For emergency situations, see below.

Custodial Access: as requested per service ticket or work schedule. Follow lab contact protocols as posted.

Other Staff (administration): follow lab protocols as posted.

1. Types of laboratories and associated hazards you might find on campus

1.1 Types:

- Chemistry labs
  - Flammable solvents*
  - Corrosive acids and bases*
  - Toxic or reactive chemicals*
    - *These types of materials must be stored in safety cabinets
  - Pressurized gas cylinders
    - Must be stored in an upright position and secured with a chain or strap to prevent falling

- Microbiology Labs
  - Pathogenic microorganisms
    - Potential risk of infection through contact or inhalation
    - Biological safety cabinets are used to store this type of material
  - Entry to these labs is **only permitted with authorization**
- Radiation and X-Ray Labs
  - X-ray equipment requires shielding and monitoring
  - Radioactive materials are strictly controlled under the Canadian Nuclear Safety Commission (CNSC)
  - Entry to these labs is **only permitted with authorization**
  - **Any unauthorized entry must be immediately reported to the Radiation Safety Officer**
- Laser Labs
  - Laser instruments
    - Laser beams can cause irreparable eye damage and/or burns
    - Laser beams may not be visible
  - Entry to these labs is **only permitted with authorization**
- Research Labs
  - May be any of the types of labs noted above

1.2 Hazards:

Chemicals

- Chemicals include everything from non-hazardous materials such as salt to more dangerous life-threatening materials.
- Both research and teaching labs can contain chemicals.
- WHMIS symbols will indicate the type of chemical hazard

Biohazardous Materials

- Bacteria, viruses, fungi, insects, plants and animals that may cause infection or disease in humans or animals
- Biohazard signage indicates where biohazards are present
- Typically, this type of lab has regulated entry protocols with restricted access

Radioactive materials

- All radioactive materials and work areas are labeled with the radiation symbol.
- Access is restricted to all labs containing radioactive material
- Escort by authorized personnel or security is required when entering areas that have radioactive materials

X-Ray Hazards

- X-Rays may pose a radiation risk or hazard
- X-Rays will be marked with signage as well as an illuminated sign indicating when the X-Ray is in use
- The Radiation trefoil sign may also be used to identify x-ray hazards

Powerful magnets

- Powerful magnets can affect medical devices including medical implants like Pacemakers, can delete or freeze electronic devices, magnetic strip cards, and can attract metallic objects

Physical Hazards

- Slipping hazards, tripping hazards, sharp objects/edges, burns, electrical hazards, compressed gas, UV Light

Laser hazards

- NEVER enter a lab containing a laser without the lab owner's knowledge and consent
- Lasers are indicated by a Laser Warning symbol posted on the exterior of the space. For high powered class 4 lasers, a "Laser in Use" sign will be also be posted on the exterior of the space if the laser is on.

2. Laboratory Signage

Laboratory door signage is placed to increase the awareness of laboratory space on campus and identify what hazards may be present. It indicates who is responsible for the space and who should be contacted in the event of an emergency or if access is required.

Signage should also communicate what the minimum entry requirements are, including Personal Protective Equipment (PPE) and if there are entry restrictions.

If access is restricted, custodial staff should only enter upon request from a submitted service ticket. This ticket should include detail regarding hazard awareness and an appropriate time for entry as accompaniment may also be necessary.

If facilities require access to restricted space, they should contact the person responsible for the lab and arrange for entry. If a service ticket has been entered, it should detail any access protocols as accompaniment may also be necessary.

Laboratories are controlled environments where specialized work occurs. Access may be limited because of:

- hazardous chemicals that may be toxic, corrosive, flammable or reactive
- biological agents such as bacteria, viruses, fungi etc.
- radiation hazards from X-ray machines or radioactive materials

3. Regulatory Framework (Ontario)

Where entry into laboratories is restricted, there can be regulatory framework that outlines the need for monitoring, control and record keeping.

- The Canadian Nuclear Safety Commission (CNSC): regulates radioactive materials and radiation devices and has strict entry protocols
- Public Health Agency of Canada (PHAC) & Canadian Biosafety Standards: regulate laboratories handling pathogens

4. Safety Data Sheets

A Safety Data Sheet (SDS) provides additional product information including PPE requirements for handling and use as well as protocols regarding what to do in the event of an exposure. A SDS must be readily available in all areas where hazardous chemicals are present and their location should be clearly identified.

Note: SDS are no longer required to be updated every three years. It is the responsibility of the manufacturer to inform the purchaser of any updates and provide the revised SDS.

5. Workplace Hazardous Materials Information System

It is important to remember that if a WHMIS symbol is present then the product is hazardous. WHMIS symbols show both the degree and type of hazard using a frame and symbol.

WHMIS SYMBOLS

	**Exploding bomb** (for explosion or reactivity hazards)		**Flame** (for fire hazards)		**Flame over circle** (for oxidizing hazards)
	**Gas cylinder** (for gases under pressure)		**Corrosion** (for corrosive damage to metals, as well as skin, eyes)		**Skull and Crossbones** (can cause death or toxicity with short exposure to small amounts)
	**Health hazard** (may cause or suspected of causing serious health effects)		**Exclamation mark** (may cause less serious health effects or damage the ozone layer*)		**Environment*** (may cause damage to the aquatic environment)
	**Biohazardous Infectious Materials** (for organisms or toxins that can cause diseases in people or animals)				

* The GHS system also defines an Environmental hazards group. This group (and its classes) was not adopted in WHMIS 2015. However, you may see the environmental classes listed on labels and Safety Data Sheets (SDSs). Including information about environmental hazards is allowed by WHMIS 2015.

6. Conditions, equipment and products that may be physical hazards

Lab areas contain a variety of different equipment, products and conditions that may be physical hazards. It is important to be aware of the conditions and equipment around you to ensure that you are safe at all time in the labs. The following list covers some of the common hazards present in the labs on a day-to-day basis.

Compressed Gas Cylinders

Compressed gas cylinders contain gas that is being held under pressure and therefore they represent an explosion hazard. These cylinders should always be secured firmly when stored, and care should always be taken not to knock a cylinder over. These cylinders should also be kept away from heat sources, as this could expand the gas within.

Acid and Flammable Chemical Storage Cabinets

Some chemicals with specific hazards are stored in designated cabinets for compatibility and safety. Only lab workers are to handle the chemicals in the cabinets. If work duties require access through one of the cabinets arrangements to have the lab workers empty the cabinet prior to commencing any duties.

Biological Safety Cabinets

Biological hazards may be used or stored in safety cabinets, such as the ones pictured below. These function to protect the operator and the room occupants by filtering out biological hazards before venting to the room or outside the building. These cabinets are tested annually or after they are moved to ensure they are providing the required protection and the exhaust filter on top of the cabinet has not been damaged.

UV Lights in biological safety cabinets are used for sterilization of the work surfaces. Reflected UV light can cause burns to skin or eye damage.

There are different types of biosafety cabinets based on the hazard level of the biological material in use.

Class 1 = protects the individual and environment but not the product

Class 2 – protects the individual, environment and the product

Class 3 = maximum protection for the individual, environment and product – used for handling dangerous pathogens

Fume Hoods

Fume hoods in labs are used by faculty and students when they are working with chemicals that are dangerous if inhaled.

Fumes are exhausted through the fume hoods directly out of the building through stacks on the roof.

Fume hoods often have flammable and acid/base storage cabinets below the actual hood.

7. Personal Protective Equipment (PPE)

In order to enter certain lab spaces, there may be a minimum requirement for wearing PPE. This typically includes closed toed shoes, safety glasses and in some cases a lab coat. Specific requirements are posted on entry doors and can be confirmed when requesting access.

When there is no activity occurring in the labs, requirements for PPE may be reviewed with the person responsible for the lab. At all times, the following should be observed:

- DO NOT move, touch, disturb or handle containers or materials belonging to a lab.
    - If materials or equipment need to be moved to perform your duties, contact your supervisor or the lab supervisor to make arrangements
- DO NOT eat, drink or adjust contact lenses in a lab
- DO always wear close-toed shoes when working in a lab
- DO wash hands – before exiting lab and/or immediately if you think your hands might be contaminated

8. Lab Worker and Supervisor Responsibilities with Respect to Safety

Responsibilities for lab safety – including the lab safety of non-lab workers – are shared by lab workers, supervisors of non-lab workers, and non-lab workers themselves.

8.1 Staff who work in labs have the following responsibilities:

- Maintain a safe work area
- Establish and follow safety protocols with all hazardous materials
- Segregate regulated hazardous waste from regular landfill waste
- Ensure broken glassware is placed in a designated box and not in regular garbage
- Ensure sharps are properly disposed of in a designated container
- Make decisions on the proper handling of spills

8.2 Staff who supervise non-lab workers have the following responsibilities before a worker starts work in a laboratory:

- Ensure workers have completed WHMIS training
- Ensure workers receive orientation to any area they may be asked to work in:
    - This should include review of this document,
    - Access protocols and
    - Clarification regarding access protocols if labs have restricted entry
- Ensure employees know:
    - What hazards may be present in the lab
    - PPE requirements (and are provided with what is required)
    - Spill/hazard reporting and/or responsibilities where applicable (depending on work to be performed)

8.3 Non-lab Worker Responsibilities:

- Notify laboratory contact prior to entry where access protocols exist
- Explain the work that will be performed
- Give advance notice if utilities will be shut off or if equipment will generate heat or sparks
- Wait for lab personnel to clear the work area of hazardous material, contamination or sensitive equipment

- Wear appropriate PPE
- Look for hazard warning signage and follow requirements
- Review the assigned work area for potential hazards prior to starting work
- DO NOT work near waste containers or work surfaces labelled with biohazard, radioactive, carcinogenic or other specific warning signs
- DO NOT hesitate to ask questions or to notify lab staff of any concerns
- Contact supervisor if in doubt about any aspect of assigned work
- Wash hands before exiting a lab where chemical contamination is possible

8.4 Non-Handler (Administrative Staff or Security who will not be handling equipment or performing work)

- Where labs are restricted (biosafety, radiation/X-ray etc.) notify lab supervisor regarding access
- Walk down centre of isles with no contact with surfaces or equipment
- Recognize general hazards in the lab
- Notify lab staff of any concerns

8.5 Scheduled Routine Handlers (Individuals who enter the lab as part of their regular duties including custodial staff)

- For restricted labs, do not enter unless specifically requested through a service ticket
- Recognize general hazards in the lab
- Walk down the center of the aisles with no contact with surfaces or equipment
- Do not hesitate to ask questions and notify your supervisor of any concerns

8.6 Reactive Handlers (need to perform specific work and may include facilities staff (plumbers, electricians etc.) or contractors)

- Contractors must be provided access and orientation from facilities contact
- Manipulate things based on a specific work or emergency request
- Recognize general hazards in the lab and specific hazards for your duties
- Give advanced warning if utilities will be shut-off or if equipment will generate sparks or heat
- Wait for lab personnel to clear the work area of hazardous material, contamination or sensitive equipment
- Do not hesitate to ask questions and notify your supervisor of any concerns

9. Common Physical Hazards

9.1 Sharp Objects:

When you enter spaces, be aware of sharp objects such as broken glass, exposed blades, needles or any “pointy bits” sticking out of waste containers. Sharp objects may contain biological material and pose a physical risk. If you encounter any of these:

- DO NOT touch or handle sharp objects
- DO NOT empty a garbage can or remove a bag containing a sharp object
    - Broken glassware should be placed in designated containers by lab users
- Report to your supervisor so they can inform the supervisor of the lab

9.2 Spills:

You may encounter unknown liquids or other spills on the floors, counters or other work areas. Spills can consist of hazardous materials and pose a physical risk. If you encounter a spill, remember:

- DO NOT touch or attempt to clean it up
- If someone is in the lab, inform them of the spill
- If no one is in the lab, contact your supervisor so they can inform the lab supervisor

10. Protocols for working in labs and approaching hazards

Always make sure you:

- obtain required approvals to enter labs
- read door signage to be aware of hazards in the lab and any required Personal Protective Equipment (PPE)
- know the access contacts and emergency contact information as posted
- DO NOT remove waste from inside labs unless it is in a regular or designated waste or recycle bin.
    - Any orange/red bags that are not in waste bins **should not** be removed by cleaning staff.
- In some cases, where access is restricted, lab users may be asked to place waste outside of labs for pickup

11. Emergency or Urgent Event Situations

On occasion there may be an emergency situation (fire, flood, medical incident) that may require immediate access by facilities or security staff.

For restricted labs the emergency contact must be notified that immediate access is required.

12. Emergency equipment

Laboratories are equipped with emergency stations such as eyewash, emergency showers (either in the lab or within close proximity and access) and sinks.

12.1 Exposure Procedures:

- Skin
  - If your skin comes into contact with hazardous materials, immediately wash the affected area with soap and water
- Eyes
  - If a splash of hazardous materials gets in your eye(s), flush using the eyewash station for a minimum of 15 minutes
  - Seek medical attention if irritation persists
- Inhalation
  - If you inhale any hazardous lab materials, move away from the area immediately and get into fresh air THEN:
    - Notify you supervisor who will notify the lab supervisor

Should any of these exposures occur, an on-line **incident report** should be completed by the worker to initiate appropriate follow-up with Health and Safety

References:

University of Victoria – Lab Safety for Non-Lab Workers

Canadian Centre for Occupational Health and Safety (CCOHS)

WHMIS

Revision History:

Date	Revision	Changes	Revised by:	Reason for revision
October 2025	New	None	F. Arnaldo (Ontario Tech University, Biosafety/Radiation Safety Officer) M. Calhoun (Durham College, EH&S Officer)	n/a