



# LABORATORY INSPECTION GUIDELINE

## **Laboratory Inspection Guideline**

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### **PDF**

Cat. No.: Em8-28/2019E-PDF  
ISBN: 978-0-660-29023-2

### **ESDC**

Cat. No.: LT-169-01-19E

# LABORATORY INSPECTION GUIDELINE

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**October 12, 2018**

The laboratory inspection guideline is meant for qualified persons or officials delegated by the Minister of Labour in inspecting and verifying compliance with existing regulations. The guideline is to be used to help determine if the lab is operating according to the Canada Occupational Health and Safety Regulations and related standards. This guideline can also be used by employers to determine if their lab is up to standards, and by employees or workplace occupational health and safety committees for reference and information purposes. Its overall purpose is to support the Labour Program's mandate of fostering healthy and safe work place environments.



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# 1. Introduction

Laboratory inspection is a technical exercise conducted by the Work Place Health and Safety Committee, ideally informed by qualified persons; or they are conducted by officials delegated by the Minister of Labour (ODM) for examining this distinct type of work place and verifying compliance with existing regulations. The lab inspection must be a routine and compulsory practice. The employer who has a laboratory in the work place must follow the regulations and standards referenced below, and keep up with the latest editions. The qualified person using the guideline for laboratory inspection must be experienced in health and safety, work place practices, tasks and rules, and the current federal legislation. The [Canada Occupational Health and Safety Regulations \(COHSR\)](#), and their incorporated codes and standards apply to the laboratory inspection for work places under federal jurisdiction.

The guideline is meant to be used as a checklist to ensure compliance with the pertinent regulation (where the provision is cited) or adherence to best practices.

## 2. General and administration

### 2.1 General duties of employer

1. Is Part II of the *Canada Labour Code* (CLC) and the COHSR posted or available in printed and electronic versions? [CLC: 125.(1)(d)(i)]
2. Is the health and safety policy of the work place posted? [CLC: 125.(1)(d)(ii)]
3. Does the employer have a hazard prevention program? [COHSR: 19]
4. Is there a record of all hazardous substances in the laboratory and is it kept up to date by the employer? [COHSR:10.3]
5. Has a training/education program on hazardous substances been developed and implemented at the lab? [COHSR: 10.14(1)]
6. Does the education/training program address the following issues? [COHSR: 10.14(2)]
  - The safety policy and procedures [CLC 125(1)(c)(ii) and COHSR 19.6]
  - Every known or foreseeable safety or health hazard in the area where employees work [CLC 125(1)(s) and COHSR 19.6]
  - Labelling and material safety data sheets [COHSR: 10.14(2)(ii)]
  - Preventive measures required [COHSR 19.6]
  - Sources of assistance and information
7. Is there a safety manual readily available?
8. Does the manual contain policies/procedures for the administration of the training/education program?
9. Have all laboratory employees been informed about the risks involved in the work place and trained in safe work procedures? [COHSR: 10.14(2)]

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10. Does the laboratory have a preventive maintenance program for equipment in place [COHSR 19.5(2)?
  11. Is the employee education/training program reviewed and revised frequently by the employer? [COHSR: 10.14(3)]
  12. Is a written record of the employee instruction and training kept by the employer? [COHSR: 10.15]
  13. Are laboratory supervisors/managers adequately trained in health and safety and informed of their responsibilities under Part II of the CLC? [CLC: 125(1)(z)]

## 2.2 Emergency plan/procedures

1. If more than 50 employees work in the building at any time, is there an emergency evaluation plan in place? [COHSR: 17.4]
2. Are there emergency procedures in place at the work place? [COHSR: 17.5]
3. Has every employee been instructed and trained in the emergency procedures and use of fire and emergency equipment? [COHSR: 17.6(1)]
4. Is a list of emergency telephone numbers posted near the telephone? [COHSR: 16.6(1)(d)]

## 2.3 Committees and representatives

1. Is there a work place health and safety committee or representative present at all times at the work place?
2. Are the names, work place telephone numbers and work locations of the health and safety committee members/representative posted? [CLC: 125.(1)(z.17)]
3. Does the committee/representative inspect the laboratory? [CLC: 125.(1)(z.12); 135.(7)(k); 136.(5)(j)]

## 2.4 Hazardous occurrences (accidents)

1. Are all hazardous occurrences, accidents or occupational disease investigated by a qualified person and the necessary prevention steps taken? [COHSR: 15.4(1)]
2. Are records for minor injuries kept and frequently updated? [COHSR: 15.7]
3. Are the, occupational diseases, and other hazardous occurrences that are listed in Canada Occupational Health and Safety Regulation 15.5 reported to an ODM within 24 hours? [COHSR: 15.5]
4. Are written reports on hazardous occurrences sent to the work place health and safety committee or representative without delay; and sent to an ODM or within 14 days after the hazardous occurrence? [COHSR: 15.8]



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## 2.5 First aid

1. Are written first-aid instructions provided for an injury, occupational disease or an illness? [COHSR: 16.2]
2. Is there a first aid attendant present in the work place? [COHSR: 16.3]
3. Is the information regarding first aid posted? [COHSR: 16.6(1)]
4. Is an adequate first-aid kit provided? [COHSR: 16.7]
5. Is a first-aid record kept and maintained for every event that occurs? [COHSR: 16.13(1)]

## 2.6 Non-smoking policy

1. Is smoking prohibited in the lab? [*Non-Smokers Health Act* (NSHA) 3(1)]
2. Are “NO SMOKING” signs posted? [6 (1)(a) *Non-Smokers Health Regulations* (NSHR)]

## 2.7 Education and training

1. Is there a complete health and safety training and education program in place for employees? Is it conducted and revised on regular basis? [COHSR 19.6; 10.14]

The education program should include the following:

- Use, location and operation of emergency and fire safety equipment, and are updated records present? [COHSR: 17.6(1)(b)]
- Use, operation and maintenance of safety equipment, safety showers and eye wash stations [COHSR 19.6(a)],
- Use, operation and maintenance of protection equipment [COHSR: 12.21]
- First aid training with multiple levels of certification available. [COHSR; 16.12]
- Hazards, storage, handling and maintenance of hazardous substances [COHSR: 10.14(c)(iii)]
- Prevention of thermal stress related illnesses and injuries? [COHSR: 10.19]

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## 3. Safety equipment

### 3.1 Ventilation

Detailed requirements for ventilation at a work place such as a laboratory are laid out in Part X of the COHSR.

1. Is every ventilation system used in the laboratory properly designed, constructed, operated and maintained?
2. Are perchloric acid fume hoods clearly identified with a warning sign?
3. Are all fume hoods, including perchloric acid fume hoods used in the laboratory designed, constructed, operated and maintained in accordance with the standards set out in the *National Building Code*, ANSI Standard ANSI Z9.2 and the most recent edition of the ACGIH® entitled *Industrial Ventilation*? [COHSR: 10.17(1)(b)(ii)]
4. Do all fume hoods, including perchloric acid fume hoods, operate at an average face velocity in the range of 0.40 – 0.50 m/s (80 – 100 fpm) with a usual sash opening that is normally 30 cm (12")?
5. Is each fume hood regularly tested for adequate face velocity?

**NOTE:** Tests should be performed by qualified person upon installation, and annually or more frequently as required.

6. Are the usual sash opening and correct face velocity displayed on the fume hood?
7. Are the fume hoods free of unnecessary apparatus and tools?
8. Are the fume hoods free of unnecessary chemicals? COHSR [10.11]

**NOTE:** The quantity of a hazardous substance to be stored in the fume hood should be limited to the quantity required for one work day. Chemical storage beneath the fume hood should only be permitted if designed for this use.

9. Is there adequate space for work in the fume hood?
10. Is there a fresh air make-up system?

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## 3.2 Fire protection

1. Are appropriate fire detection, suppression and alarm systems and equipment installed?  
This includes the following:
  - Detectors
  - Alarm systems
  - Sprinkler systems
  - Fixed extinguishing systems
  - Portable fire extinguishers
2. Are these systems and equipment properly inspected and maintained? [COHSR: 17.3]
3. Are extinguishers provided for every type of fire that can occur in the laboratory? [COHSR: 17.3(1)]
4. Are fire blankets available to laboratory staff?
5. Are inspections carried out at least once every 6 months? Review records. [COHSR: 17.9]
6. Is emergency lighting provided and regularly tested and maintained? [COHSR: 2.2; 6.10]

## 3.3 Safety showers, eyewash stations, and other safety equipment

1. Where there is a hazard of skin or eye injury from hazardous substances, are safety showers and eyewash stations provided for immediate use by employees? [COHSR: 16.8(1)] Is this equipment properly installed and maintained?
2. Are special materials/equipment for neutralizing, absorbing, and cleaning up spills available? [COHSR: 17.5(1)(b)]
3. Is all safety equipment inspected and maintained regularly?

## 3.4 Personal protective equipment (PPE)

**NOTE:** PPE is to be used only for hazards that cannot be removed by other means.

1. Is PPE that meets the appropriate standard used? [COHSR: 12.1]  
This includes the following:
  - Eye and face protection: safety glasses with side shields or goggles, full face shields [COHSR: 12.6]
  - Skin protection: Impermeable gloves, lab coats and aprons, biosafety suits, etc. [COHSR: 12.15(1)(c)]
  - Respiratory protection: air purifying or air supplying as required [COHSR: 12.14(1)]
  - Special applications: safety boots [Canada Occupational Health and Safety Regulations 12.12(1), hearing protectors, [COHSR: 12.5; 7.7] etc.

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## 4. Laboratory operational safety

### 4.1 Layout and design

1. Do the design and construction of the laboratory meet the requirements of the *National Building Code*? [COHSR: 2.2]
2. Are non-laboratory operations separated from the laboratory? [COHSR: 10.9; 2.2]
3. Are shelves strong enough for their load and securely fastened? [COHSR: 14.50(1)]
4. Are shelves that can be loaded from either side provided with barriers/partitions? [COHSR: 14.50(3)]
5. Are cabinets stable? [COHSR: 14.50(3)]
6. Are the drawers equipped with stops so they cannot be pulled out or drop out of guides?
7. Are there any splinters, sharp edges on furniture or equipment?
8. Is sufficient lighting provided? [COHSR: 6.5 ;14.50(3)(a)]
9. Are floors equipped with floor drains?
10. Are glass items and containers of hazardous substance stored within easy reach (not on a high shelf or on top of a cabinet) [14.50(3)(f); 10.8]

**NOTE:** If a spill of a hazardous substance is likely to cause environmental damage, drains with built in containment devices or floors with dikes at walls, counters and doors may be required. The employer should be referred to the appropriate environmental regulator for specific requirements.

11. Are sinks and drains resistant to chemicals used?
12. Are sinks equipped with glass traps (to be used with all chemicals except when using hydrofluoric acid)?

### 4.2 Housekeeping and maintenance

1. Is the laboratory kept in a neat, orderly arrangement? [COHSR: 10.14(2)(c)]
2. Are benches, floors, shelves, and hoods kept free of reagents and equipment not in use? [COHSR: 10.11]
3. Do all laboratory employees clean their working areas regularly? [COHSR: 10.14(2)(c)]
4. Are storerooms kept clean? [COHSR: 10.8]
5. Are the following turned off when not in use?
  - Gas lines and vacuum sources
  - Water spigots
  - Gas burners
  - Electrical equipment (where possible)
6. Is an emergency gas shut-off valve available? [COHSR: 10.24(b)]

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7. Is there any broken or chipped glass?
  8. Is broken or chipped glass disposed of safely in dedicated marked container?
  9. Are floors slippery or uneven? [COHSR: 2.14(3)] Are spills cleaned immediately? [COHSR: 10.8]
  10. Do floor mats create tripping hazards?
  11. Are there other tripping hazards?
  12. Are materials stored on the top of cabinets? [COHSR: 14.50(3)(f); 10.8]
  13. Are materials piled insecurely? [COHSR: 14.50(3)(f)]
  14. Is there glassware stored on shelves above an average person's eye level? [COHSR:14.50(3)(f)]
  15. Are shelves too crowded? [COHSR: 14.50(3)]
  16. Are there open drawers?
  17. Is working space crowded?
  18. Are aisles obstructed? [*Canada Labour Code* 125(1)(p)]
  19. Are exits blocked? [*Canada Labour Code* 125(1)(p)] [COHSR: 17.9]
  20. Are there any unguarded moving parts? [COHSR: 13.13]
  21. Is lifting equipment in good condition? [COHSR: 14.20]
  22. Are there any defective tools in use? [COHSR: 13.9; 13.10]
  23. Are equipment supports in good condition?

### 4.3 Electrical safety

1. Do the design, construction and installation of all electrical equipment in the laboratory meet the standards set out in the *Canadian Electrical Code*? [COHSR: 8.3]

**NOTE:** The word "laboratory" is **not** included in the vocabulary of the *Canadian Electrical Code*.

Laboratory work areas, laboratory units, laboratory hood interiors shall be considered as unclassified electrically with respect to Article 500 of NFPA 70, *National Electrical Code* [NFPA 45: 3.6.2]. There are exceptions to this rule as identified in NFPA 45.

2. Are electrical panels, cables, fixtures, and fittings maintained in safe operating condition?
3. Are electrical receptacles, switches and controls located in such places so that they are not subject to liquid spills? [NFPA 45]
4. Are there any electrical receptacles, switches, and controls in fume hoods?

**NOTE I:** In installations where electrical receptacles, switches, and controls are within the fume hood, additional electrical disconnects shall be located within 15 m of the hood and shall be accessible and clearly marked. [NFPA 45: 6.8.4]

**NOTE II:** If electrical receptacles are located external to the hood, no additional electrical disconnect shall be required.

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5. Are portable electric tools grounded or otherwise properly protected? [COHSR: 13.4]
  6. Is all electrical equipment grounded or otherwise properly protected?
  7. Are ground fault circuit interrupter (GFCI) type of receptacles installed where needed (e.g. within 3 m of a sink, washbasin, bathtub or shower stall)?
  8. Are the disconnecting means required for motors, appliances or branch circuits such as circuit breakers legibly marked to indicate their purpose?
  9. Is the electrical equipment marked with the manufacturer's name, trademark or other descriptive markings providing voltage, current, wattage or other ratings as necessary?
  10. Is there clear access to switches, control devices or meters? [COHSR: 8.23]
  11. Is there an emergency lighting system? [COHSR: 6.10(1)]
  12. Is there emergency power for all emergency equipment? [COHSR: 2.2; 6.10; 17.3]
  13. Is there a lockout procedure for machinery and equipment? [COHSR: 8; 13.16]

## 5. Hazardous substances

### 5.1 Labelling

1. Are all containers of hazardous substances, other than controlled products, labelled? [COHSR: 10.27]
2. Are all containers of explosives, cosmetics, devices, drugs or food, pesticides, radioactive substances or consumer products received from a supplier and present in the laboratory, labelled? [COHSR: 10.27; 10.31(1)]
3. Is a supplier label applied to each controlled product received from a supplier, and to each container received from a supplier in which the controlled product is contained? [COHSR: 10.35(1); possible exemptions 10.39(1); 10.39(2); 10.39(3)]
4. Is a sign posted or a work place label applied to the controlled product, other than a fugitive emission, that is not in a container? [COHSR: 10.36(1)]
5. Is a work place label applied to the container of a controlled product produced in the work place, that will not be used exclusively in the laboratory and that is not intended for export? [COHSR: 10.36(2)(3)]
6. Is a work place label applied to the container in which an imported controlled product is placed? [COHSR: 10.36(2)(3)]
7. Is a sign posted in a conspicuous place near an unlabelled controlled product intended for export or near the container of a controlled product offered for sale in Canada while in the process of being appropriately labelled? [COHSR: 10.36(3)]
8. Do the labels disclose all required information? [COHSR: 10.39]
9. Is the information disclosed on a sign and/or on a label clearly legible to employees? [COHSR: 10.40; 10.41]

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## 5.2 Safety data sheets (SDSs)

1. Are SDSs present at the laboratory for all hazardous substances? [COHSR: 10.28; 10.32; 10.33]

**NOTE:** The laboratory is exempted from the requirement to retain a supplier SDS if the supplier of the controlled product is exempted by the *Hazardous Products Regulations* from the requirement to provide a SDS and if the controlled product meets the requirements specified in the COHSR [COHSR: 10.32(4)]

2. Are SDSs available for all hazardous substances in the laboratory? [COHSR: 10.34]
3. If a SDS has a trade secret claim, is the date on which the claim for exemption was either registered or granted and a registry number or statement to the effect an exemption was granted, provided? [COHSR: 10.42(1)]
4. Where a controlled product in the laboratory is hazardous waste, does the employer disclose the generic name and hazard information? [COHSR: 10.43]

## 5.3 Storage and handling

### 5.3.1 General

1. Are chemical inventories kept up-to-date, by the employer? [COHSR: 10.3]
2. Is each hazardous substance properly stored, handled, and used? [COHSR: 10.8]
3. Are all processes that generate airborne contaminants conducted under fume hoods? [COHSR: 10.9]
4. Are inter-reactive chemicals (e.g. corrosive materials, oxidizing materials, and reactive flammable materials/aerosols, poisonous and infectious materials) properly stored and handled? [COHSR: 10.8, 10.46; 10.47; 10.48]

### 5.3.2 Laboratory storage

1. Are reagents and solvents stored in small quantities? [COHSR: 10.11]
2. When maximum permissible quantities are exceeded, are flammable and combustible liquids stored in proper cabinets or rooms? [*National Fire Code of Canada* (NFCC) 4.2.4.2]
3. Is storage of flammable and combustible liquids in cabinets and rooms compatible and in permissible quantities? [NFCC 4.2.4.2]
4. Is each refrigerator, freezer or cooler prominently marked to indicate whether or not it meets the requirements for safe storage of flammable liquids? [NFPA 45]

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### 5.3.3 Storerooms

1. Is the storeroom for equipment separated from the reagent storeroom? [COHSR: 10.8; 10.9]
2. Is the reagent storeroom identified by a sign? [COHSR: 10.13]
3. If applicable, is a separate storage facility available for flammable and explosive materials, and flammable aerosols? [COHSR: 10.45; 10.47(d)]
4. Does the storage room have proper ventilation system?

### 5.3.4 Hazardous waste

1. Are there any outdated chemicals? [COHSR: 10.8; 10.9, 10.32(1)(c)]
2. Is a waste management program in place?  
It should include the following:
  - Categories of waste materials and their associated hazards
  - Types of containers used for disposal/storage of various Waste products
  - Labelling [COHSR 10.43(1)(a)]
  - Record keeping
  - Initial treatment (e.g. dilution or neutralization of chemicals, autoclaving or chemical inactivation of biohazardous materials)
  - On-site handling systems for waste

### 5.3.5 Compressed gases and cryogenic liquids

1. Are compressed gases properly stored and handled? [COHSR 10.8]
2. If applicable, are these stored in a fireproof, dry, well ventilated area?
3. Are cylinders securely anchored? [COHSR 10.8]
4. Where the compressed gas storage area is considered a hazardous location, is it free of sources of ignition? [COHSR 10.8]
5. Are gases that may react with one another stored separately? [COHSR 10.8]
6. Are full cylinders separated from empty cylinders?
7. Are all empty cylinders clearly marked EMPTY?
8. Do all cylinders have caps on when not in use? [COHSR 10.8]
9. Are cylinder carts available for transport?
10. Do all cylinders have proper labels? [COHSR 10.35]
11. Are proper regulators connected to the cylinders in use? [COHSR 10.24(b)]
12. Adaptors that permit mixing of incompatible gases are not allowed.
13. Is every assembly of pipes used for transferring gas/vapour clearly identified? [COHSR: 10.24(a)]



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14. Is there clear access to each safety device/valve controlling the supply of gases/vapours?
  15. Are warning signs posted where cryogenic liquids are stored or being used?
  16. Are vessels containing cryogenic liquids?
    - Listed/designed for that purpose?
    - Stored in a proper location?
    - Stored away from heat sources?

### 5.3.6 Radiation emitting devices

1. Are sources of exposure to ionizing/non-ionizing radiation identified and a hazard investigation carried out by a qualified person? [COHSR: 10.4(1)]
2. Is the radiation level under 50% of the values referred in relevant sections of the Part X? [COHSR: 10.4(2)(h)]
3. Are safety procedures for control of ionizing/non-ionizing radiation established (consulted with work place health and safety committee or representative; or a policy committee)? [COHSR: 10.5(1)]

**NOTE:** The purchase, possession, use, transportation, and disposal of radioactive material and radioisotopes are subject to the provisions of the *Nuclear Safety and Control Act* and the *Nuclear Substances and Radiation Devices Regulations*.

4. If the device is referred in 10.26(2), then the employer should implement the applicable document, as amended from time to time and published by Health Canada? [COHSR: 10.26(1)(a); 10.26(2)]

### 5.3.7 Biohazardous infectious material

1. Are poisonous and infectious materials properly stored and handled? [COHSR: 10.47(c)]
2. Are there any uninvestigated risks of infections from needles and syringes, spills and sprays, broken glass or other sharp objects, aspiration through pipettes, bites or scratches of animals or ectoparasites or other vectors? [COHSR: 10.4(1)]
3. Are safety procedures and instructions for dealing with infectious materials established and available to laboratory employees? [COHSR: 10.5(b)]
4. Are effective disinfectants available at all times in the laboratory?
5. Are laboratory employees protected against potential infection by immunization where possible and do they show immunity?
6. Is access to the laboratory limited or restricted in accordance with the requirements for each level of containment?
7. Are appropriate biological safety cabinets provided?
8. Have the cabinets been tested and certified within the previous 12 months according to the accepted standards?
9. Are autoclaves provided as appropriate and regularly tested after installation by the use of biological indicators?

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10. Are high-efficiency particulate air (HEPA) filters installed in accordance with the requirements for each level of containment?
  11. Are all HEPA filters tested to ensure that they meet the required specifications after installation?

**NOTE:** Safety practices related to biohazardous infectious materials should conform to the Laboratory Biosafety Guidelines published by the Medical Research Council of Canada and Health Canada.

## 6. Noise

COHSR Part VII, *Levels of sound*, is most relevant to noise control at the work place. It lays out regulations for measuring noise, required hearing protection, reporting requirements, and noise exposure levels.

1. Are there any obvious sources of sound to which the employees are likely to be exposed for a duration that may endanger their hearing? [COHSR: 7.3(1)]
2. Is the noise level at the work place below the noise exposure limit as mentioned in the COHSR regulations? [COHSR: 7.2(5)]
3. Are there effective controls and PPE implemented and available at the work place to reduce noise exposure? [COHSR: 7]
4. If so, has an investigation of the degree of exposure been carried out in accordance with COHSR: 7.3(1)?

## 7. Thermal stress

Until recently, extremes of heat or cold were considered physical hazardous substances under Part X of the COHSR without explicitly mentioning thermal stress. However, due to an increasing number of employee and employer concerns relating to exposure to thermal stresses on a regular basis, it became essential to prescribe thermal stress mitigation requirements in amendments to Part X of the COHSR.

Thermal stress in the work place guideline and relevant infographics should be used for reference.

Consult [canada.ca/workplace-health-safety](https://www.canada.ca/workplace-health-safety)

1. Is the laboratory temperature maintained at a comfortable level so that employees do not complain that it is too hot or too cold?
2. Are there monitoring and control procedures for thermal stress in place at the laboratory?
3. Are there temperature controls, other specific controls in place at the laboratory?

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## 8. Other safety measures

1. Are loose clothing, long hair, dangling accessories, jewellery, or other similar items tied, covered, or otherwise secured to prevent a hazard? [COSHR: 12.12]
2. Is laboratory clothing restricted to the areas to which the garments are assigned?

**NOTE:** Laboratory coats should not be allowed in the eating areas.

3. Is suitable footwear with closed toes and heels worn in all laboratory areas?
4. Is oral pipetting prohibited in the laboratory?
5. Is eating and drinking prohibited in the laboratory? [COSHR: 9.38]
6. Is food prohibited from being stored in laboratory refrigerators? [COSHR: 9.38]
7. Is there any evidence of non-compliance with safety rules?
8. Are there warning signs for safety measures posted in the laboratory?

## 9. Additional resources

1. OSHA Laboratory Safety Guidance  
<https://www.osha.gov/Publications/laboratory/OSHA3404laboratory-safety-guidance.pdf>
2. WHMIS 2015 – Laboratory  
[https://www.ccohs.ca/oshanswers/chemicals/whmis\\_ghs/laboratories.html](https://www.ccohs.ca/oshanswers/chemicals/whmis_ghs/laboratories.html)
3. Safe work with flammable and combustible liquids  
[https://www.ccohs.ca/oshanswers/prevention/flammable\\_general.html](https://www.ccohs.ca/oshanswers/prevention/flammable_general.html)

## 10. References

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