SAFETY AWARENESS

CUSTODIAL WORK IN LABORATORIES AND WORKSPACES WITH HAZARDOUS MATERIALS

Raico Laria Lamela
Associate Director
Biohazard, Radiation, and Chemical Safety
Environmental Health & Safety Department
Queen's University

PURPOSE

Ensure the protection and training of custodial and support staff servicing laboratory spaces

- Recognize specific laboratory hazards
- Understanding bloodborne pathogens
- Know main safety precautions (PPE)
- Waste management inside the labs
- Emergency Response

LABORATORY HAZARDS

LABORATORY

Is a **dedicated** space in a building for conducting scientific test, teaching science, or producing goods (chemicals or biologicals) by trained individuals.

- Depending upon the scientific research being conducted, a lab can be filled with different type of **HAZARDS**

- **Physical Hazards**
  - Electrical
  - Mechanical
  - Radiation devices
  - Sharps (blades, glass, needles)

- **Chemical**
  - Explosive
  - Corrosive
  - Toxic
  - Radioactive

- **Biological**
  - Infectious samples
  - Non-infectious samples
  - Animals

The workplace hazard symbols are easily understandable pictograms that enable you to quickly identify a hazard. They form part of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

- If you work with, or around chemicals you must take Queen's WHMIS (Workplace Hazardous Materials Information System) training.

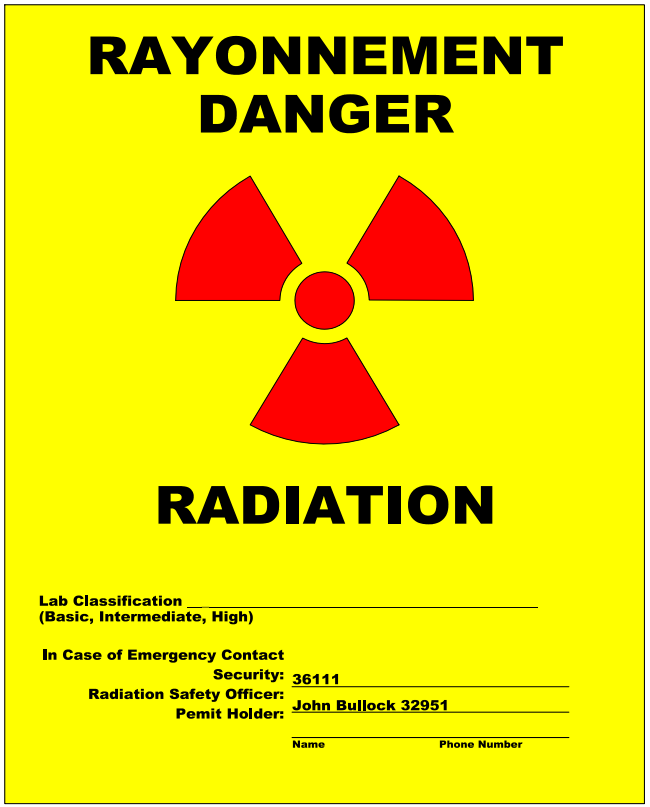
CHEMICAL HAZARDS

RADIATION HAZARDS

- This door sign indicates the lab is in possession of a nuclear substance or radiation device.

  - Nuclear substances emit radiation in different forms.
  - We are normally exposed to certain level of radiation (space and earth). Natural background radiation.
  - When radiation exceeds specific levels can cause cancer and other developmental defects.

- **We implement controls within our Radiation Protection Program (RPP) to ensure that we never approach dangerous exposure levels.**



X-RAY & LASER

- *Only dangerous when in operation.

WHAT ARE BIOLOGICAL HAZARDS?

- **Biological hazards (biohazards) are biological agents that can cause disease**

- Pathogenic agents include:

- Bacteria, Fungi, Viruses, Parasites, Prions, and Microbiological Toxins

- Pathogens can be found in:
  - Blood (Bloodborne pathogens)
  - Human and animal tissues
  - Body fluids/secretions:
    - saliva, mucous
    - vomit, fecal matter, urine
    - semen, vaginal secretions
  - Cultures in the laboratory
  - Environmental samples

WHAT ARE BLOODBORNE PATHOGENS?

Microorganisms such as viruses or bacteria that are present in human blood and can cause diseases in humans

- **Human Immunodeficiency Virus (HIV)**
- **Hepatitis B Virus (HBV)**
- **Hepatitis C Virus (HCV)**

HOW ARE THEY TRANSMITTED?

- Puncture wounds caused by sharp objects
- Infectious materials contacting open wounds, cuts, or broken or damaged skin
- Infectious materials contacting mucous membranes of eyes, nose and mouth

HEPATITIS

- Vaccine is available to prevent Hepatitis A & B
  - Vaccinations are available through the University's medical program. There is also a SOP on Hep vaccinations that outlines conditions for department payment of vaccinations
- No vaccine for Hepatitis C – so follow procedures to prevent infection
- Treatment (but not cure) of Hepatitis C infections is possible, so early identification of infection is important

HIV OR AIDS (ACQUIRED IMMUNE DEFICIENCY SYNDROME)

- Survival – Drying in the environment causes rapid (within several hours) 90%-99% reduction in HIV concentration
- No cure and no vaccine
- Early medical attention is important. Post-exposure prophylaxis within a few hours can prevent infection.
- If infected, effective treatment is available so early identification is important.

Disease	Risk of transmission	Prevalence in 1000 people
Hepatitis B (Needle stick)	30%	<1
Hepatitis C (Needle stick)	3%	7
HIV (Needle Stick)	0.3%	2
HIV (Muc.	0.09%	2

RISK OF TRANSMISSION

SAFETY PRECAUTIONS AND WORK PRACTICES

PERSONAL PROTECTIVE EQUIPMENT (PPE)

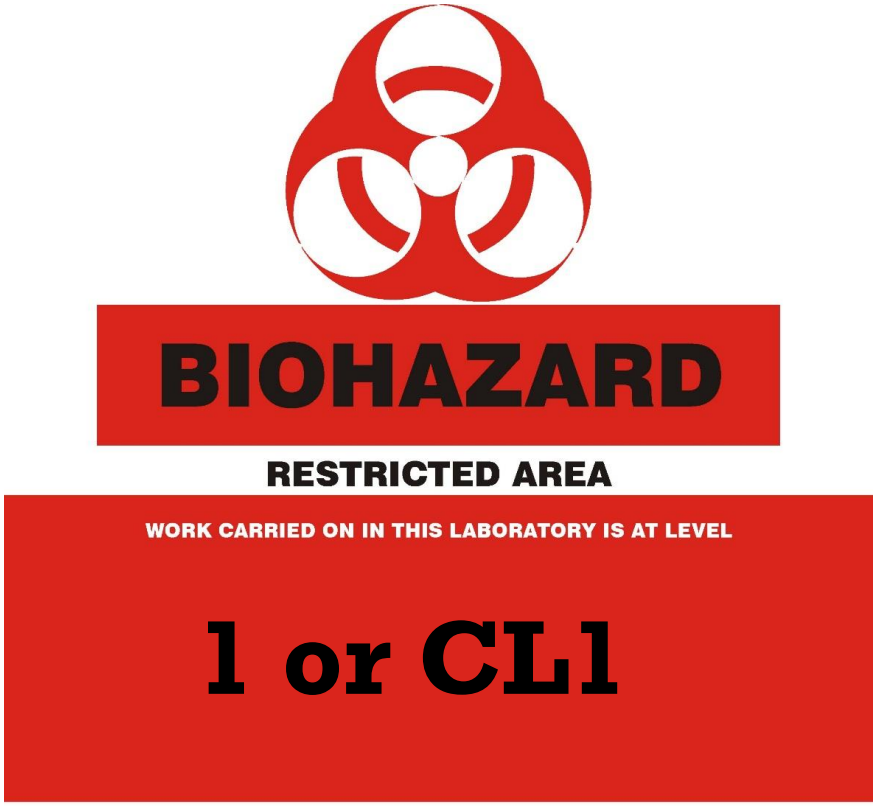
- Gloves
  - for hands and skin protection
- Safety Glasses
  - Eye protection against splashes
- Closed toe shoes
- Long pants

PROTECTION AGAINST RADIATION EXPOSURE

DO NOT EAT OR DRINK in	Do not bring any food or drink into a lab space.
DO NOT enter	A radiation STORAGE ROOM without supervision or authorization.
Keep	Safe distance from radiation sources identified with the radiation symbol
DO NOT Touch or clean	laboratory benches and sinks
DO NOT enter	an area where X-RAY or Lasers are in operation.

Containment Level 1

- Pathogens that are common in the environment and **do not cause disease in healthy adults or animal (RG1)**



- **DO NOT EAT OR DRINK in the lab**

No restriction to enter and clean/service the lab, (Clean doorknobs, light switches and the floor), but it is recommended to avoid touching laboratory sinks, benches or equipment.

Lab floors must be accessible for cleaning. Researchers are responsible for ensuring floors are accessible.

Laboratory floors can be either dry or wet mopped. Do not vacuum without prior approval of the researcher and your supervisor.

Clear path to allow for unobstructed filling of soap and paper towel dispensers.

Use minimum PPE
Handwash is rec before leaving the room

Containment level 2

- Pathogens that **can cause a serious disease (RG2) but unlikely to do so**
  - route of infection is contact or ingestion (**not airborne**)

AREA	BLDG		ROOM	RESPONSIBLE INVESTIGATOR	
HAZARD OR RESTRICTION:					
SPECIAL PROCEDURES OR PRECAUTIONS:					
THIS LABORATORY IS APPROVED AT LEVEL					
ADMIT	☐ STAFF ☐ GUARD ☐ CLEANER ☐ MAINTENANCE ☐ EMERGENCY PERSONNEL				
NOTICE	CALL OR SEE	BLDG	ROOM	PHONE	HOME PHONE
FOR ENTRY OR ADVICE					
IN CASE OF EMERGENCY					
IN CASE OF EMERGENCY					

No restriction to enter and clean/service the lab (Clean doorknobs, light switches and the floor), but It is recommended to avoid touching laboratory sinks, benches or equipment.

Lab floors must be accessible for cleaning. Researchers are responsible for ensuring floors are accessible.

Laboratory floors can be either dry or wet mopped (Bleach 10%). Do not vacuum without prior approval of the researcher and your supervisor.

Use minimum PPE!
Handwash is rec before leaving the room

- **DO NOT EAT OR DRINK in the lab**

BIOHAZARD

RESTRICTED AREA

WORK CARRIED ON IN THIS LABORATORY IS AT LEVEL

2+ or CL2+

AREA	BLDG		ROOM	RESPONSIBLE INVESTIGATOR	
HAZARD OR RESTRICTION:					
SPECIAL PROCEDURES OR PRECAUTIONS:					
THIS LABORATORY IS APPROVED AT LEVEL					
ADMIT	☐ STAFF ☐ GUARD ☐ CLEANER ☐ MAINTENANCE ☐ EMERGENCY PERSONNEL				
NOTICE	CALL OR SEE	BLDG	ROOM	PHONE	HOME PHONE
FOR ENTRY OR ADVICE					
IN CASE OF EMERGENCY					
IN CASE OF EMERGENCY					

- **DO NOT EAT OR DRINK in the lab**

Containment level 2+

- Microorganisms that require more strict containment practices (RG2+)

Access is **restricted** to these labs.

Or the lab has been **decontaminated by lab personnel** for special custodial task like sealing the floor or repairs.

Hand protection: glove removal

(1) Pinch glove near your wrist and pull slowly towards your fingers. Turn the glove inside out while pulling.

(2) Continue holding glove with one hand while removing the other hand from the glove.

(3) Slide finger from glove-free hand under other glove. Slide approximately half of your finger under the glove.

(4) Rotate your finger ~180°, and pull glove outwards towards your fingertips. Turn the glove inside out while pulling.

(5) Holding the glove by the uncontaminated surface, transfer to biohazard waste bin.

HANDWASHING

- Hand washing is the single most important procedure for preventing the spread of biological contamination
  - At least 30 seconds
    - sing happy birthday - TWICE
  - Use technique shown on the next slide

- Always wash your hands after removing gloves
  - It is possible to contaminate your hands or wrists while removing gloves

HANDWASHING

http://www.publichealthontario.ca/en/BrowseByTopic/InfectiousDiseases/JustCleanYourHands/Pages/Just-Clean-Your-Hands.aspx#.VFkxy_nF_AQ

LABORATORY WASTE MANAGEMENT

REGULAR GARBAGE WASTE

Non-contaminated general waste in laboratories will continue to be serviced by Custodial Services

Only large gray bins labeled as **Garbage Only** will be serviced. These must be placed close to the door of the laboratory.

Smaller under-desk bins may be used inside the laboratory, however, waste from these must be placed in the larger bins by laboratory staff for disposal to avoid potentially contaminated materials from entering the general waste stream. Waste from non-labeled bins will not be serviced.

CL2+ Lab personnel will put regular garbage and glass garbage into the hall (after decontaminating the outside) for custodial services to empty.

TEACHING LABORATORIES

- One of the exemptions to this process involves teaching laboratories where a large amount of regular waste is collected in several bins located inside the laboratory. These may be under the benches or between the isles and have been historically serviced by custodial staff. These are instances where a large volume is generated requiring frequent service and it is unreasonable for laboratory instructors or technicians to collect the individual bins and consolidate them into larger ones.

- These waste bins should continue to be serviced by facilities. However, they must comply with the above statement as far as being the standardized *gray bins labeled as* ***Garbage Only.***

HAZARDOUS WASTE

- **ALL hazardous waste** bins in the laboratory must be clearly labeled with the appropriate type of hazard. It is the responsibility of the laboratory personnel to label the bins with stickers (see appendix A-C) since they are most knowledgeable about the contents.

DO NOT TOUCH OR HANDLE

BIOHAZARD GARBAGE CONTAINERS

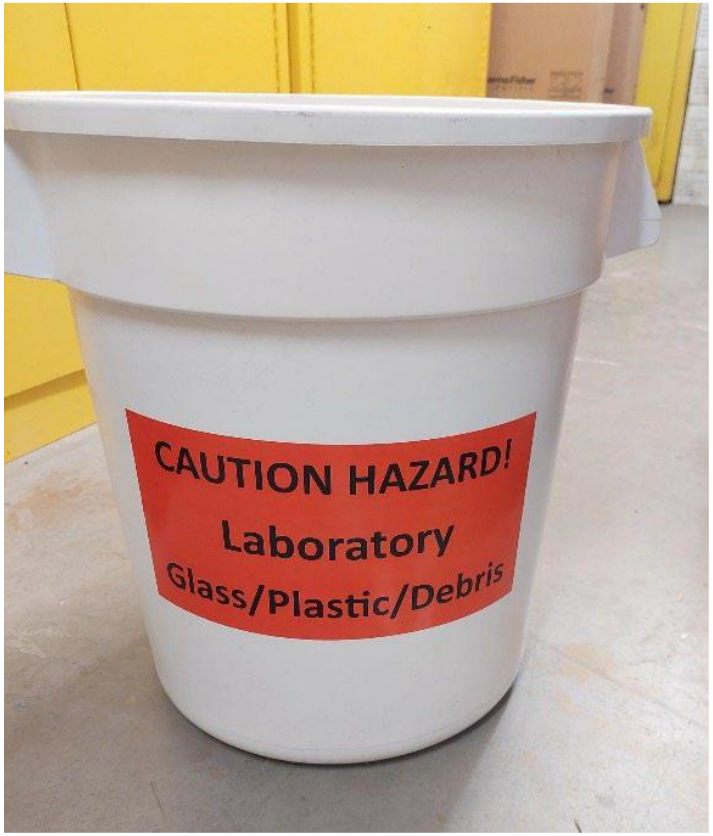
DO NOT TOUCH OR HANDLE

LAB PLASTIC RECYCLING CONTAINERS

Laboratory plastic is collected in gray 80 L bins lines with a blue coloured bag. The bins are labeled with a sticker.

Shared containers should be placed in a common location near other general waste bins or recycling containers serviced by custodial services.

LABORATORY GLASS, NON-RECYCLABLE PLASTIC AND CONTAMINATED DEBRIS



Custodial Services will no longer remove Caution Hazard! Laboratory Glass/Plastic/Debris bins.

EMERGENCY RESPONSE

IF YOU COME ACROSS….

Leave in place

- Anything with a chemical symbol
- Drug Paraphernalia

Call Campus Security and Emergency Services (CSES)

Stay with the item until CSES arrive and secure the items

Others such as EHS may be called to respond

NEEDLESTICK , CUTS OR PUNCTURES

If the skin is punctured by a syringe or needle or you are cut by a sharp that could be contaminated encourage the wound to bleed and do not suck the wound.

Rinse thoroughly with running water

Report Incident to your supervisor

Get prompt medical treatment (KGH Emergency Room or Walsh and Associate)

Thank you for your participation!

Natalie Roy
Safety Technician (Biohazard & Chemical)
Department of Environmental Health & Safety
Queen's University

Jamie Coad
Safety Technician (Radiation & Chemical)
Radiation Safety Officer
Department of Environmental Health & Safety
Queen’s University