

# Laboratory Safety & Biohazards



Methodology in Clinical  
Biochemistry-BIOC 6007 (MSc)

Spring 2018



# Objectives:

- To define the essential safety components of laboratory safety programs
- Laboratory Safety requirements
- How to monitor lab safety and its compliance
- Identify Hazardous materials and procedures in the lab



# Type of Hazards in the lab:

1. Biological
2. Chemical
3. Electrical
4. Radiological
5. Fire
6. Sharp needles and glasses



# Why does it matter?

- **Safe working protects:**
  - You
  - Other lab workers
  - Cleaners
  - Visitors
  - Your work



# Safety Management Plan in Lab

- Development, management, and enforcement of quality safety management program.
- Risk assessment. (E.g. OSHA)
- Safety manuals
- Follow up with laboratory safety guidelines. (E.g. WHO has ACDP)



# How to do a Risk Assessment?

- Determine **hazards** and evaluate **risks**
- Use all relevant **available data**
- Determine **controls** needed to minimise those risks
- **Document** the assessment
- **Agree** it with your supervisor
- **Use** those control measures



# Some safety points in safety manual:

- All housekeeping issues inside the lab
- Personal protections
- Decontamination of medical equipment
- The proper use of eye-wash and first aid kits
- Safe evacuation during the emergency plan
- Accidental injuries
- Medical staffs responsibilities



# Some Control Measure Points:

1. Use of less risky substances in the lab. Solutions are better than powders.
2. Wearing protective means always. Lab coats, gloves, glass.... Etc.
3. The use of fume cupboards with a volatile substance
4. No eating or drinking in lab (No GSMs ! No make-ups on the face!)
5. No smoking
6. Acid to Water and not Water to Acid
7. Small volume inside the big volume and not the opposite !
8. Know places of emergency exists and fire fighting equipment's
9. Assembly points and telephone no list locations
10. During the fire cause escape by being at lower heights to avoid smokes
11. Do not use lifts during the fire cause
12. Handling of strong acid bottles (Bottle transportations)
13. Waste managements. Biological wastes
14. How wash hands !
15. Shoes must be worn
16. No pipetting by mouth
17. No food store in refrigerator or freezers





# Laboratory Safety requirements:

1. Safety policies, assessments and guidelines
2. Safety manual (SOP)
3. Safety officer (Regular inspections)
4. Safety equipment's and cabinets
5. Trainings, GLP and CPD
6. Personal safety awareness



# Hazardous Substances in the Lab:

- Broken glass
- Spillages on floor
- Gas cylinders
- fire burners
- Liquid gas for cooling purpose
- Electrical equipment
- Chemicals
- Patient samples



# Laboratory Design for Safety:

- Escape routes and area
- Water supply and washing hands
- Air ventilation systems (filters)
- Safety equipment locations
- Doors and windows for fire resistance
- Non-flammable items and furniture's
- Rest room is out-side of laboratory area



# Daily standard measures in lab:

1. Decontamination of surfaces
2. Waste managements
3. Temperature controls
4. Inventory for safety items
5. Filling daily maintenance forms
6. Reports any spills

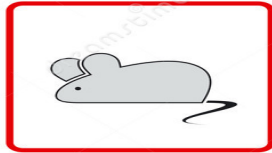


# Handling of Biological materials:

- All specimens should be consider as a hazardous
- All specimens should be well sealed – not leaking
- Wear protective means
- No miss-matched samples with requests
- Wash hands thoroughly
- Knowledge on how to clean spills. Place paper on spills, then pour 1-5% of hypochlorite solution on it and wait for 10 mins then mob the are with disinfectants completely.



# Signs of hazards:



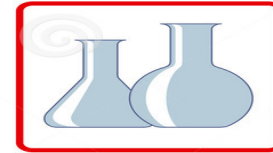
Animal hazard



Sharp instrument hazard



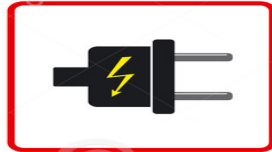
Heat hazard



Glassware hazard



Chemical hazard



Electrical hazard



Eye & face hazard



Fire hazard



Biohazard



Laser radiation hazard



Radioactive hazard



Explosive hazard



# Questions !

- How to clean mercury drop down?
- How to clean chemical spills?
- Explain steps you will take during any fire emergency?
- Mention some GLP process within the lab?



# The End of Lectures

- Thanks for listening.