

Laboratory Safety Manual

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*Lab
Safety
Manual*
1st Edition



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1. INTRODUCTION AND GENERAL INFORMATION

The purpose of the Laboratory Manual is to provide users with information designed to ensure health and safety in laboratories. This manual also meets Occupational Safety and Health Administration (OSHA) requirements. The Laboratory Safety Manual is not intended to be comprehensive but should supplement specific procedures developed by the person(s) responsible for unique laboratory hazards.

Laboratory personnel must have access to this manual and other health and safety documents at all times. Faculty of medicine is committed to providing a safe laboratory environment for its faculty, staff, students and visitors. The goal of the faculty Laboratory Safety measures is to minimize the risk of injury or illness to laboratory workers by ensuring that they have the training, information, support and equipment needed to work safely in the laboratory.

Scope The present Laboratory Safety Manual describes policies, procedures, equipment, personal protective equipment, and work practices that are capable of protecting students and all users (including visitors) of all laboratories at College of medicine. This manual is applicable to students, teaching assistants, visitors, and any individual entering spaces assigned to labs. This manual covers field work / in-room experiment, handling testing equipment/tools, taking readings during/after lab session, storing materials, tools and equipment, performing basic maintenance tasks, and housekeeping.

Definition of Laboratory:

At faculty of medicine, a laboratory is defined as, but is not limited to, any location where research or teaching is conducted using hazardous chemicals, bio hazardous, biological materials, radioactive materials, and/or radiation producing devices.

A storage room containing the above materials is considered a laboratory if the materials are stored in support of teaching or research.

Material safety data sheet (MSDS):

The Material Safety Data Sheet (MSDS) is a document that contains information on all possible dangers that can be found in the laboratory environment and how to properly use chemicals and laboratory equipment. The MSDS provides more detailed information about the chemicals compared to the chemical bottle labels. The MSDS is prepared by the supplier or manufacturer of the chemical to describe what the hazards of the product are, how to use the product safely, what to expect if the recommendations are not followed, what to do if sudden accidents happen, how to recognize signs of over exposure, and what to do if such accidents take place. This is an important document that should be available in ALL college laboratories.

We should always be familiar with the DOs and DONTs when using a product BEFORE you start using it. You look into the MSDS corresponding to the product you are going to use, by matching the name of the item/chemical on your container to the one on the MSDS. Be aware of the risks, understand safe handling and storage instructions, and know what to do in an emergency in a chemical accident.

Roles and Responsibilities:

The most important safety rule in any laboratory is that every person involved in a laboratory operation, from the teacher to the student, must have safety in mind. It is impossible to design a set of safety rules that will cover all possible dangers and incidents. Safety awareness can only become a part of everyone's habits only if safety issues are discussed over and over again.

Departments:

are responsible for adopting and implementing the policies within the Laboratory Safety Manual in laboratories under their administrative control.

Teaching staff:

All concerned lab staff must accept the responsibility of his or her job in accordance with best safety practices. The laboratory education provides a pivotal role in teaching science because students can acquire concrete knowledge regarding different kinds of science related subjects. Normally, new students are initially advised of general safety issues at the start of each academic year. If some students are absent from this event, it is the responsibility of the teacher to give them a separate lecture in an appropriate time. All concerned teaching staff is responsible

for identifying hazards and minimizing risks to students during practical classes.

The laboratory staff must read and understand all the laboratory standards and procedures. They should report immediately any possible hazardous accident to the office of the laboratory superintendent and provide the necessary assistance to rectify any problems.

Laboratory assistants and workers:

Laboratory workers are, in many cases, the “first line of defense” with regards to lab safety. All workers have the right to be informed of the known physical and health hazards of the hazardous chemicals and apparatus in their work areas and to receive adequate training to work safely with such substances and equipment.

Laboratory security:

Laboratory security is an integral part of an effective laboratory safety program. Laboratory Assistants and Laboratory Attendants are required to follow these procedures to ensure the security of the laboratory.

1. Keep laboratory doors locked when unoccupied. Unauthorized persons must not be allowed inside the lab. This information must be posted outside the lab doors.
2. Keep stocks of organisms locked during off hours or when the laboratory is unoccupied.
3. Keep an accurate record of chemicals, stocks, cultures, project materials, growth medium, and other items that support such experimental activities.
4. Inform the College Security through the office of the Laboratory Superintendent if materials are missing from the laboratory.
5. Inspect all packages arriving at the work area.
6. When any Lab Activity/Research is completed for the day, ensure that chemicals and biological materials have been properly stored and secured.
7. Ask strangers (someone not recognized as a co-worker or support staff) for identification. If they are not authorized to enter the lab, ask them to leave.
8. Keep high hazard materials under lock and key. Highly hazardous materials include radioisotopes, carcinogens, etc.
9. Maintain a catalog for receiving, using, and disposing of highly hazardous materials and these must be documented at all times.

Cleaning staff and repair workers

The cleaning staff routinely cleans the lab, but they have very poor knowledge of laboratory hazards. We can avoid any unpleasant incident only if we follow the safety guidelines and correctly disposal procedures. The laboratory infectious waste can be disposed in conjunction with the adjacent **Regional laboratory**. Make sure that the laboratory staff, and *not* the cleaning staff, is responsible for cleaning laboratory work surfaces, refrigerators, freezers, and apparatus. Arrange the separate bins according to “ordinary” waste and to “hazardous” waste. All bins must be clearly labeled.

Housekeeping

Good housekeeping helps to avoid many safety and health problems. Used absorbent pads must be discarded and the workstation tops must be wiped at least once a day. Clear the bench tops of all unnecessary glassware and materials. Keep the floors free of boxes, instruments, and supplies by storing them at their right places.

Students are expected to observe all applicable safety practices and procedures contained in this Laboratory Safety Manual, and report any unsafe or hazardous conditions to the lab supervisor.

Disabled person

Particular safety issues may arise for temporary disabled students, workers, and visitors. It is best to review these on a case-to-case basis according to college safety guidelines to avoid accidents.

Visitors are all persons entering a laboratory other than the laboratory staff, and enrolled students and authorized faculty employees. Visitors to faculty laboratories will be under the supervision of the host laboratory. The host is responsible for laboratory security during the visitation, and notification of potential hazards, and oversight of visitor compliance with applicable safety practices and procedures contained in the Laboratory Safety Manual.

II- LAB HAZARDS

Identification:

Hazard identification should begin with a walk through survey of the laboratory to develop a list of potential hazards.

Types:

1. Chemical Hazards:

- Fire/Explosion
- Chemical and Thermal Burns
- Absorption of Chemicals
- Inhalation of Chemicals
- Ingestion of Chemicals

2. Physical Hazards:

- Slips, Trips and Falls
- Cuts, Scrapes, Bruises

3. Biological Hazards:

- Contact with Infectious Agents

4. Electrical Hazards

5. Radiation Hazards

Chemical Hazards Health effects:

- Allergens
- Embryotoxins
- Carcinogens Toxic or highly toxic agents
- Nephrotoxins
- Irritants- Corrosives Sensitizers
- Hepatotoxins
- -Reproductive toxins
- Neurotoxins Hematoxins (blood)
- Asphyxiants
- Mutagens
- Teratogens

- Radioactive isotopes

Physical Hazards health effects:

1. Flammable and Combustible liquids & gases materials which under standard lab conditions can cause a fire in the presence of an ignition source.
2. Corrosives - a material that can corrode metal or tissue.
3. Water Reactive Materials – react with heat to form explosive gasses
4. Reactive – chemicals that release energy quickly, possibly resulting in detonation.
5. Oxidizers – Can explode in contact with organics or strong reducers.
6. Pyrophoric – ignite spontaneously in air.
7. Peroxide Forming Chemicals and Organic Peroxides- unstable materials that are sensitive to shock or accidental ignition.
8. Compressed Gasses – present hazards from unplanned release.
9. Cryogenics – Super cooled liquids that can damage body tissue.

Equipment Hazards:

- **Sharp Objects:** The most common lab injuries come from contact with sharp equipment, slips, trips, falling objects, broken glass, etc.
- **Electrical Hazards:** Electrical hazards include use of high-voltage equipment, wet environments, harsh environments that may deteriorate insulation, and automatically starting equipment
- **Mechanical Hazards:** Some equipment has moving parts that may present pinching or crushing hazards, may catch loose clothing, or may vibrate or move while running
- **High/Low Temperature Surfaces:** Fires, hot plates, extreme cold, and hot equipment are common in labs and may cause burns without proper precautions
- **UV Light:** UV and laser light may cause burns or eye damage
- **Flying Particles:** Flying particles and chemicals may occur frequently and without warning from various lab equipment and operations

- **Containers under High Vacuum/Pressure:** Containers placed under high vacuum or pressure can become hazardous in certain circumstances
- **Electric and Magnetic Fields:** Electric and magnetic fields (EMFs) are invisible lines of force associated with the use of high-voltage electric power. Health effects are uncertain, but individuals with pacemakers or metallic implants should take precautions
- **Ionizing and Non-Ionizing Radiation:** Radioactive sources may be present in certain analytical equipment
- **Heavy Objects:** Certain tasks in the lab may involve heavy lifting or repetitive motions that, over time, may lead to musculoskeletal disorders

Routes of Exposure:

- **Inhalation of vapors,** gasses, mists, or particulates.
- **Skin contact** with certain chemicals can cause damage to skin tissue or allow absorption of chemicals into the blood.
- **Ingestion** through the gastrointestinal tract.
- **Injection** from skin punctures from contaminated objects.

III- LAB SAFETY RULES AND PROCEDURES:

1. Lab Specific Standard Operating Procedures Required
2. General Safety Principles
3. Health and Hygiene
4. Food and Drink
5. Housekeeping
6. Hazardous Materials
7. Transferring Materials
8. Compressed gases
9. Unattended Operations
10. Working Alone
11. Volunteers in the Lab
12. Laboratory Security

Lab specific standard operating procedure required:

Principal Investigators and Lab Supervisors must assess the risks and identify hazards associated with working in their area. Once hazards are identified, they must develop, implement and maintain lab-specific procedures to safely address high hazard materials/processes, and then train laboratory personnel on applicable procedures. In relatively low hazard labs, the procedures outlined in this manual may be sufficient. Faculty and staff may create their own procedures or use publicly available resources such as reference books, internet sites (of a reliable source), or lab manuals.

1. General safety principles:

1. Each student should use personal protective equipment. Remove laboratory coats when leaving the laboratory. Change laboratory coats immediately upon significant contamination and do not wash laboratory clothing at home.
2. Safety goggles should be worn especially when experiments involve dangerous chemicals.
3. Do not touch the face, apply cosmetics, adjust contact lenses, or bite nails during any experiment. When laboratory activities are anticipated, prescription glasses should be worn unless a student cannot see without contact lenses.
4. Wash arms and hands immediately after working with allergens, carcinogens, pathogenic organisms, at the end of experiments and before leaving laboratory
5. Observe lab safety posters and placards and chemicals packages/bottles stickers.
6. Clean all spills and leaks quickly. Spill kits should be purchased and used to assist in clean-up operations.
7. NEVER take food and drink into the lab
8. NEVER smoke in the laboratory.
9. NEVER rush and move slowly in the laboratory.
10. NEVER block laboratory emergency exits.
11. Avoid smelling or tasting chemicals.
12. Observe lab safety posters and placards and chemicals packages/bottles stickers.
13. Avoid using damaged glassware. Broken glassware should be discarded in sealed boxes.
14. Never touch mercury and apply extreme care when dealing with its salts.
15. Never pipette solutions by mouth and always use rubber pipette bulb.
16. Never smell/sniff/taste chemicals since they are generally harmful/ poisonous.
17. Never use flammable liquids near hot surfaces, direct flame or sources of fire.
18. Never transfer hazardous chemicals out of the lab and apply careful handling
19. Used needles and syringes, razor blades, Pasteur pipettes and other sharp equipment should be placed in special containers labeled "sharp".

20. Do not engage in practical jokes, horseplay, or other acts of carelessness in the lab.
21. Tie long hair and fix loose clothing. Avoid wearing finger rings/jewelry that may become contaminated, react with chemicals, or be caught in the moving parts of equipment.
22. Wear shoes at all times in the laboratory. Sandals, flip-flops, perforated shoes, open-toed shoes, or canvas sneakers are prohibited in the laboratory.
23. Each individual is responsible for keeping the work area clean.
24. Chemicals and equipment should be clearly and correctly labeled as well as properly stored.
25. Clean work area upon completion of a procedure. Make sure that everything is clean in the laboratory at the end of each day.
26. Appropriate warning signs must be posted by the instructor conducting the experiment near any dangerous equipment or experiment.

2.SPECIAL LAB SAFETY PRECUATIONS

Chemical hazards.

1. Every individual who enters the laboratory must have a proper knowledge of the toxic effects of these chemicals, the routes of exposure and the hazards.
2. Material safety data sheets or other chemical hazard information are available from chemical manufacturers and/or suppliers. It should be read well before dealing with any chemicals.
3. Chemicals should be stored and handled so that they cannot come into contact with the chemicals that can cause explosion to fire.
4. Dispose of chemicals in their proper containers and segregate according to instructions.
5. When handling chemicals note the hazard code on the bottle and take the appropriate precautions indicated in MSDS (Materials safety data sheet).
6. Return all chemicals, reagents, cultures, and glassware to their appropriate places.
7. Do not pour chemicals down the sink.

8. Any chemical spills must be immediately reported to your course instructor.

Compressed gases

1. Cylinders with regulators must be individually secured. Only cylinders with valve protection caps securely in place may be safely gang-chained (chained in groups).
2. When storing or moving a cylinder, have the valve protection cap securely in place to protect the stem.
3. Cylinders must be secured in an upright position at all times. Use suitable racks, straps, chains, or stands to support cylinders against an immovable object, such as a bench or a wall, during use and storage. Do not allow cylinders to fall or lean against one another.
4. Use an appropriate cart to move cylinders.
5. Never bleed a cylinder completely empty. Leave a slight pressure to keep contaminants out.
6. Oil or grease on the high-pressure side of an oxygen cylinder can cause an explosion. Do not lubricate an oxygen regulator or use a fuel gas regulator on an oxygen cylinder. Use an oxygen approved regulator.
7. Always wear goggles or safety glasses with side shields when handling compressed gases.
8. Use appropriate gauges, fittings, and materials compatible with the particular gas being handled.
9. When work with a toxic, corrosive, or reactive gas is planned, the CHO should be contacted for information concerning specific handling requirements. Generally, these gases will need to be used and stored with local exhaust ventilation such as a lab hood or a gas cabinet designed for that purpose.
10. Outside contractors/suppliers have been hired to exchange empty cylinders with full ones. Faculty and staff should limit moving cylinders, but when necessary, use the cylinder restraint cart.

Biohazards:

There are four Biological Safety Levels (BSL). They are categorized according to the activities that take place in particular biological labs. These levels are scaled from ONE to FOUR based on the agents or organisms used in the experiment. For example, a basic lab setting, which deals with nonlethal agents that present a minimal potential threat to lab workers and the environment, is generally considered BSL-1, the lowest biosafety lab level. A specialized research laboratory that deals with possible deadly infectious agents like Ebola would be ranked as BSL-4, the highest and most severe level.

Biosafety Levels:

Biosafety Level	BSL-1	BSL-2	BSL-3	BSL-4
Description	<ul style="list-style-type: none"> · No Containment · Defined organisms · Unlikely to cause disease 	<ul style="list-style-type: none"> · Containment · Moderate Risk · Disease of varying severity 	<ul style="list-style-type: none"> · High Containment · Aerosol Transmission · Serious/Potentially lethal disease 	<ul style="list-style-type: none"> · Max Containment · "Exotic," High-Risk Agents · Life-threatening disease
Sample Organisms	E.Coli	Influenza, HIV, Lyme Disease	Tuberculosis	Ebola Virus
Pathogen Type	Agents that present minimal potential hazard to personnel & the environment.	Agents associated with human disease & pose moderate hazards to personnel & the environment.	Indigenous or exotic agents, agents that present a potential for aerosol transmission, & agents causing serious or potentially lethal disease.	Dangerous & exotic agents that pose a high risk of aerosol-transmitted laboratory infections & life-threatening disease.
Autoclave Requirements	None	None	Pass-thru autoclave with Bioseal required in laboratory room.	Pass-thru autoclave with Bioseal required in laboratory room.

Dealing procedures with Biological hazards

1. Observe aseptic technique at all times when dealing with microbial cultures. Students will NOT be permitted to work in the laboratory unless a lab instructor is present.
2. Regard all organisms and biological materials used in this laboratory as potentially infectious and pathogenic to humans.
3. Work areas/surfaces must be disinfected before and after use.
4. Label all materials with your name, date, and any other applicable information (e.g., media, organism, etc.).
5. Dispose of wastes in their proper containers (see Biohazard Waste Disposal below).
6. Do not pour biohazardous fluids down the sink.
7. Flame transfer loops, wires, or needles before and immediately after use to transfer biological material.
8. Do not walk about the laboratory with transfer loops, wires, needles, or pipettes containing infectious material.
9. Be careful around Bunsen burners. Flames cannot always be seen.
10. Turn off Bunsen burners before leaving the laboratory.
11. Immediately, report any broken glass, especially those containing infectious materials.
12. If you are injured in the laboratory, immediately contact your course instructor or TA.
13. Use appropriate universal precautions with all biological fluids.

Stock culture requirements

According to the safety standards recommended by the “Centers for Disease Control and Preventions” and “Biosafety in Microbiological and Biomedical Laboratories”, we must develop a habit of safe handling of microbes in any college laboratory. By doing so, the safety perception of the students turns into habit. We must educate and promote a safety awareness and culture among the students and staff. The following guidelines may help us regarding stock culture activities:

- It is best to request cultures from approved, commercial, or reputable sources. Cultures separated from clinical samples must not be used.
- Keep and update all the documents about stock organisms, sources, and handling of stock cultures.
- Arrange fresh stock cultures of microorganisms every year (e.g., purchased or revived from frozen stock cultures) to be certain of the source culture, to minimize spontaneous mutations, and to reduce contamination.



Figure 14 Laboratory culture medium

Lab animals

1. Be cautious when handling animals. Do not treat animals as pets, and any animal bite must be carefully monitored with appropriate first aid procedures.
2. Wash hands before and after handling the animals.
3. Respect the animals. Ensure that they are fully anesthetized or dead before carrying dissection.
4. It is recommended to disinfect the animal with 70 % ethanol before dissection. All dissection tools should be disinfected in 70 % ethanol before and after use.
5. All waste related to animal work are bio hazardous waste and waste disposal procedure for such category should be strictly followed.
6. All animals are not allowed to be left outside the cage. Any escape or lose of animals

should be reported to the lab instructor.

7. Considered Work areas/surfaces must be disinfected before and after use.
8. Dispose of wastes in their proper container.

Health and Hygiene:

Avoid direct contact with any hazardous material. Know the types of protective equipment required while using any chemical. If in doubt, review the appropriate section of the MSDS.

1. Confine long hair and loose clothing and always wear footwear that fully covers the feet.
2. Do not mouth-pipette.
3. Use appropriate safety equipment whenever there is a potential for exposure to hazardous gases, vapors, or aerosols. Check to ensure that local exhaust ventilation equipment is working properly before use. In the event that general or local exhaust ventilation is not functioning properly, immediately stop work, notify Facilities, and place a sign to notify others that work with hazardous materials is suspended until the equipment is working properly.
4. Wash thoroughly with soap and water after handling chemicals or biological materials, before leaving the laboratory and before eating or drinking.
5. If there is a hazardous splash potential, splash goggles shall be worn as eye protection.
6. Clean and store personal protective equipment as appropriate.
7. Laboratory employees shall be familiar with the signs and symptoms of exposure for the materials with which they work and the precautions necessary to prevent.

FOOD AND DRINK IN THE LABORATORY

1. Avoid eating, drinking, smoking, or applying of commercial products in any laboratory area where hazardous chemicals or biological hazards are in use.
2. Refrigerators and microwave ovens used for chemical or biological storage or other laboratory use shall not be used for food storage or preparation.

House Keeping

1. Keep work areas (including floors) clean and uncluttered. Clean up work areas after the work is finished or at the end of each lab or workday.
2. Dispose of waste per the GVSU disposal policies described in Section 2.10 or the building-specific plan. A separate receptacle must be designated for non-contaminated glass. Contaminated glass is considered hazardous waste and disposed of accordingly.
3. Clean spills immediately and thoroughly, as per the guidelines in this document and the product MSDS. Ensure a chemical spill kit is available. Faculty, staff, and students should receive training on the proper procedures of cleaning a spill and a designated employee shall assure that the spill kits are properly stocked.
4. Do not block exits, emergency equipment or controls. Do not use hallways and stairwells for storage. Assure hazardous chemicals are properly segregated into compatible categories (section 5.1.4).
5. Custodial responsibilities are limited to sweeping the floors except when chemicals and biological materials are present and emptying the trash.

Hazardous Material Handling and Storage

1. Chemical containers with missing or defaced labels should not be accepted.
2. Chemicals utilized in the laboratory or hood must be appropriate for the type and capacity of the ventilation system.
3. Hazardous biological materials should be manipulated using safety equipment and techniques appropriate to the risk group and the evaluated biosafety level of the specific experimental conditions. Biosafety cabinets used to protect researchers from biological hazards must be functioning properly, certified annually and appropriate to the biological and chemical hazards in use.
4. Hazardous materials should be stored in appropriate safety cabinets, closed cabinets or not more than five feet above the floor.
5. Chemicals shall be segregated by compatibility.

6. Hazardous material storage areas must be labeled as to their contents (section 5.1.4)
7. Storage of hazardous materials at the lab bench or work area shall be kept to a minimum.
8. A Hazardous material mixture shall be assumed to be as toxic as its most toxic component.
9. Substances of unknown toxicity shall be assumed to be toxic.
10. Each lab must maintain an inventory of all chemical along with a MSDS for each chemical.
11. Since chemicals and other biological organisms are stored in lab refrigerators or freezers, we must not store food in such places.
12. Refrigerators and freezers must be labeled appropriately, ("NO FOOD" or "FOOD ONLY - NOCHEMICALS") depending on the intended purpose of the equipment
13. . All chemical storage containers must be labeled with the name of the contents and appropriate hazard warnings.
14. The label must contain the full chemical name, not abbreviations or chemical formulas. Chemicals must be stored based on compatibility. Chemicals should not be stored in alphabetical order but should be stored by danger-related class.
15. In other words, flammables, acids, bases, oxidizers, reactive, poisons, etc, are some of these classes that should be separated from each other. For example, Nitric acid is an oxidizing agent and should be stored away from other acids.
16. Since chemicals and other biological organisms are stored in lab refrigerators or freezers, we must not store food in such places. Refrigerators and freezers must be labeled appropriately, ("NO FOOD" or "FOOD ONLY - NOCHEMICALS") depending on the intended purpose of the equipment. All chemical storage containers must be labeled with the name of the contents and appropriate hazard warnings.
17. The label must contain the full chemical name, not abbreviations or chemical formulas. Chemicals must be stored based on compatibility. Chemicals should not be stored in alphabetical order, but should be stored by danger-related class. In other words, flammables, acids, bases, oxidizers, reactives, poisons, etc, are some of these

classes that should be separated from each other. For example, Nitric acid is an oxidizing agent and should be stored away from other acids.



Storage of chemicals inside the lab

Transferring of Hazardous Materials

1. Carry glass containers in bottle carriers or other leak resistant, unbreakable secondary containers.
2. When moving hazardous materials on a cart, use a cart suitable for the load and with raised edges to contain leaks/spills.
3. Transporting of hazardous waste between buildings within a campus should be done with all necessary precautions to avoid spills or leaks. Transporting waste between campuses should not be done.

Unattended operation

1. Check with your laboratory supervisor to determine if the operation can be left safely unattended.
2. If the operation is to be left unattended for extended periods and involves hazardous materials or potentially hazardous conditions, develop a protocol. It should be reviewed by the laboratory supervisor and CHO. The protocol should include responses to potential

interruptions in electric, water, inert gas and other services and provide containment for hazardous materials.

3. A warning notice must be posted near the experiment if hazardous conditions are present. This notice must contain information concerning the hazard such as indicators of problems and who to contact if such evidence is present.

Working Place

1. In no case is working alone permitted during procedures involving highly hazardous or toxic chemicals or agents and/or dangerous equipment or environments (i.e.: anything that could cause severe injury or death).
2. It is the responsibility of the Principal Investigator or Lab Supervisor, with support of GVSU safety staff, to assess activity of high and low or moderate risk, and develop policies and procedures appropriate for each type of work. It is preferable that departmental staff collaborate on common procedures, processes and equipment for consistency with individual policies.

Volunteer in the Lab

Any volunteer conducting lab work must be provided with written documentation. No one under the age of 16 is allowed to work or volunteer in a lab.

Lab Security:

1. Laboratory Personnel Responsibilities: For research labs, Principal Investigators are responsible for the security of their laboratories. In teaching labs, the Department Chair is responsible for chemical and equipment security.

2. Laboratory Access: Faculty, staff and students will be provided with access cards or brass keys upon approval by the Department Chair or Dean of the College, or their designee.

3.SAFETY EQUIPMENTS IN THE LABS

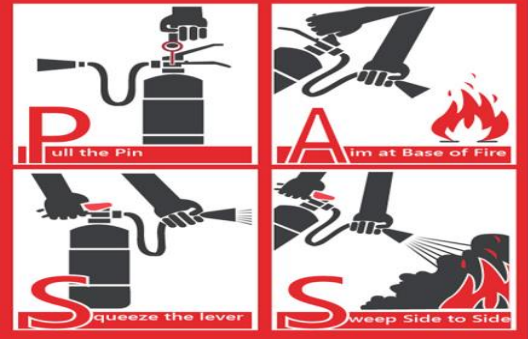
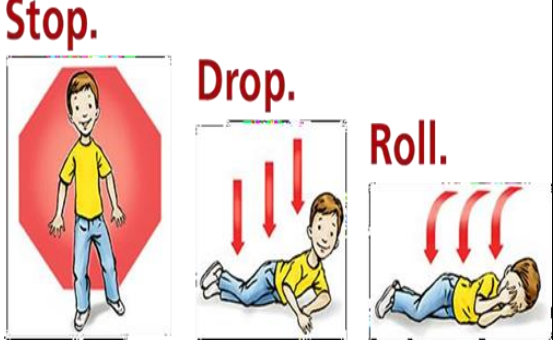
Determine the location of appropriate safety equipment and supplies for managing spills and accidents involving chemical, biological, and radiological materials. Safety equipment should include eyewash, fire extinguisher, first aid kit, PPE, safety shower, and spill control kit. Refer to Section D, “Equipment” for details



Safety equipment protects personnel, ensures proper storage of hazardous materials, and enables a laboratory to respond to emergencies. Each laboratory should be evaluated for adequate safety equipment during the development of an Emergency Action Plan and/or standard operating procedures (SOPs) and during a laboratory’s annual safety survey.

3.1 Fire extinguisher

- ✓ All employees must be well informed and trained on how to use fire extinguishers.
- ✓ Fire extinguishers must be readily available in all the buildings particularly in the labs to deal with the sudden onset of fire.
- ✓ The fire extinguisher is very easy to use if we remember the acronym PASS, which stands for Pull, Aim, Squeeze and Sweep. In case of fire, also pull the fire alarm and call **998** to report the location of fire.
- ✓ When you hear the fire alarm, EVERYONE must quickly proceed to a nearest exit for safe evacuation.
- ✓ All teaching staff should announce and illustrate the location of the nearest exit at the beginning of the class during each semester. Everyone should aid physically disabled individuals to reach a safe location.
- ✓ The installation of fire extinguishers must be done according to the OSHA standards and the University lab safety department may arrange the demonstration and training session

for interested staff

	
<p>How to operate fire extinguisher</p>	<p>Stop Drop and Roll in case one's clothing is on fire</p>

	
<p>Fire blanket and instructions for use</p>	

3.2. Containment/Safety Shields

Appropriate containment or shielding must be used when splashing, spattering, or aerosolizing of materials is anticipated. A barrier such as a blast shield should be used when working with explosive materials. Refer to Section E, "Safety Practices for Specific Hazards". Radiation and laser shielding techniques are extremely important safety issues and are described in the Radioactive Materials Safety Manual and Laser

Safety.

3.3 Eyewash Fountains

An eyewash fountain must be readily accessible in all areas where corrosives, hot liquids, or other eye-irritating materials (formaldehyde) are used or stored. During development of an Emergency Action Plan, personnel must identify eyewash fountain locations, verify proper function, and determine if additional eyewash fountains are required in the laboratory. Ensure that eyewash fountain locations are marked with a sign (typically green/white, available from EH&S) posted at eye level above the fountain. Eyewash fountains must be flushed monthly by laboratory personnel. Record these tests on the “Safety Equipment Test Record” tag (available from EH&S) attached to the eyewash

	
<p>Face Safety Shields</p>	<p>Eyewash Fountains</p>

3.4. Biosafety cabinets

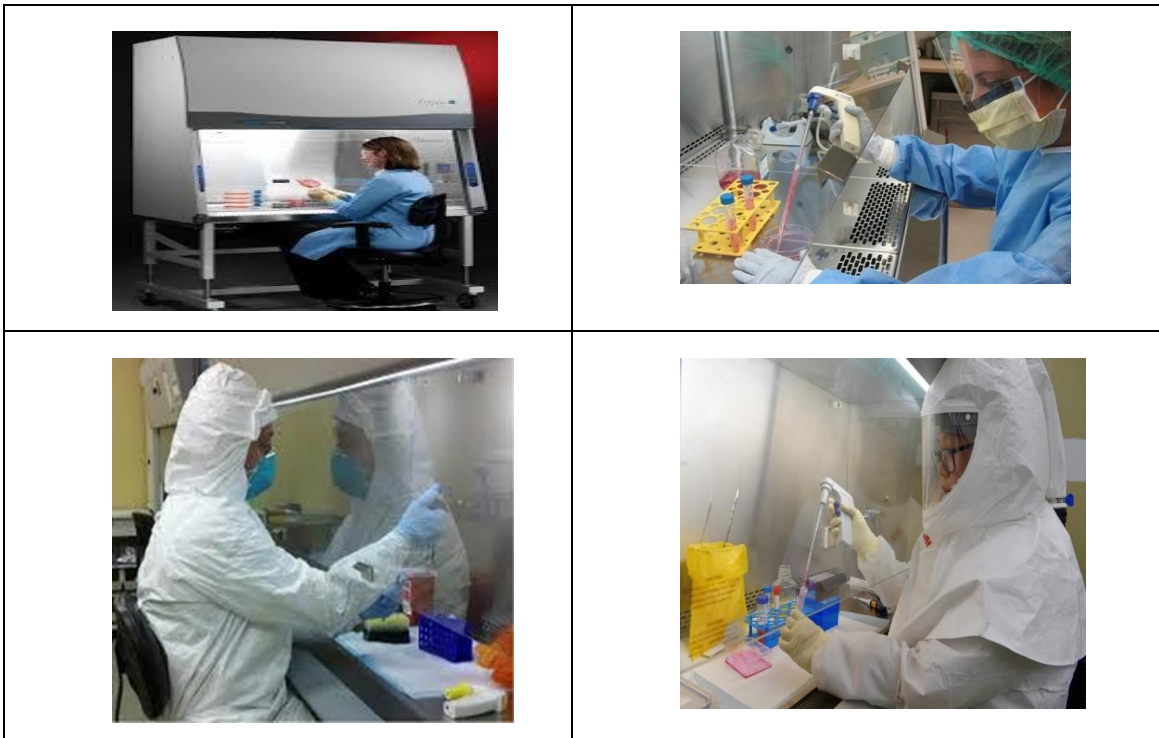
A biological safety cabinet basically provides three kinds of protection:

- Personal protection from the hazardous agents inside the cabinet
- Product protection to avoid contamination of work, experiment, and other processes
- Environmental protection from contaminants contained within the cabinets.

Class I - a ventilated cabinet for personal and environmental protection, with a non-recirculated airflow away from the operator. It is similar to fume hoods, except it may or may not be connected to an exhaust duct system. There is no product protection. May be used for Biosafety Level 1, 2, or 3.

Class II - a ventilated cabinet for personal, environmental, and product protection with an inward HEPA filtered airflow for personal protection. May be used for Level 1, 2, or 3.

Class III a totally enclosed, ventilated cabinet of gas-tight construction. Operations in the cabinet are used through attached rubber gloves. The cabinet is kept under a slightly negative air pressure. Supply air is HEPA filtered and the exhaust is double HEPA filtered or a combination of HEPA filter and incineration. May be used for Biosafety Level 4.



3.5. Fume hoods

Fume hoods must be available in all those labs, which are dealing with flammable, toxic, volatile chemicals, or deadly microbes. They are designed to provide personal protection against all such potential hazards. The fundamental purpose of the fume hood is to capture the harmful fumes, gases or microbes present in the air and throw them out of the lab. Mixing of volatile chemicals must be done inside the fume hood to minimize the inhalation exposure. According to OSHA (29 CFR 1910.1450), fume hoods must be maintained and should be functioning properly when used.



Fume hood

3.6. Laboratory Refrigerators/Freezers

Refrigerators and freezers used for flammable liquid storage must be manufactured for that purpose. Modification of general-purpose (domestic) refrigerators/freezers for flammable liquid storage is NOT permitted. General purpose refrigerators/freezers must be labeled to prohibit storage of flammable materials (Caution: Do Not Store Volatile Materials in This Box)



Lab refrigerator

Laboratory refrigerators and freezers must not be used to store food or beverages intended for human consumption. Affix an appropriate label to the refrigerator/freezer door (Caution: For Chemical Storage Only, No Food or Drink).

Prior to defrosting freezers used to store radioactive materials, a survey of the frost must be conducted to determine radioactive material content. To avoid the spread of contamination and minimize personnel exposure, carefully melt or remove contaminated frost and collect the water as radioactive waste.

3.7. Safety Showers

An easily accessible, drench-type safety shower shall be available within ten seconds travel time of each area where corrosive or toxic liquids are used or stored. In some buildings, laboratories may need to rely on safety showers outside the laboratory. During development of an Emergency Action Plan, personnel must identify safety shower locations and verify proper function by contacting the building area mechanic. Ensure that safety shower locations are marked with a sign (typically green/white, available from EH&S) posted at eye level below the shower. Annual safety shower testing is performed by Facilities Planning and Management (FP&M).

	
<p>Lab safety shower</p>	<p>Eye wash</p>

Now, due to the growing rate of lab accidents in the teaching labs, the interest has begun to grow in lab safety. Emergency shower and eye wash are the basic emergency equipment. They must be located within 10 seconds of unobstructed approach in the working area where eyes and body of the worker may be exposed to injurious, corrosive materials during the lab activity. The emergency shower and eye wash must be periodically checked to ensure proper usage when required.

3.8. Spill Kits





A properly stocked spill control kit shall be available in each laboratory. Spill kits are available at Central Stores or safety equipment suppliers. In lieu of purchasing a kit, personnel may choose to assemble a kit. The spill control kit must contain appropriate neutralizers for acids and bases stored in the laboratory.

3.9. First Aid Kits

The first aid kit is the most important part in the lab safety contents as students might encounter chemical, physical or health hazards during the course of an experiment. It helps to protect staff, students and the college property. It demands trained and knowledgeable staff to deal with the emergency situations in the lab. There must be someone who is capable to do initial emergency procedures before proper treatment is available. If an emergency occurs in the lab, the instructors are expected to act in an efficient way with minimal display of emotion. They are required to evaluate the problems with great attention and initiate actions according to the victim's symptoms. They should take measures to lessen the anxiety or fear of the injured

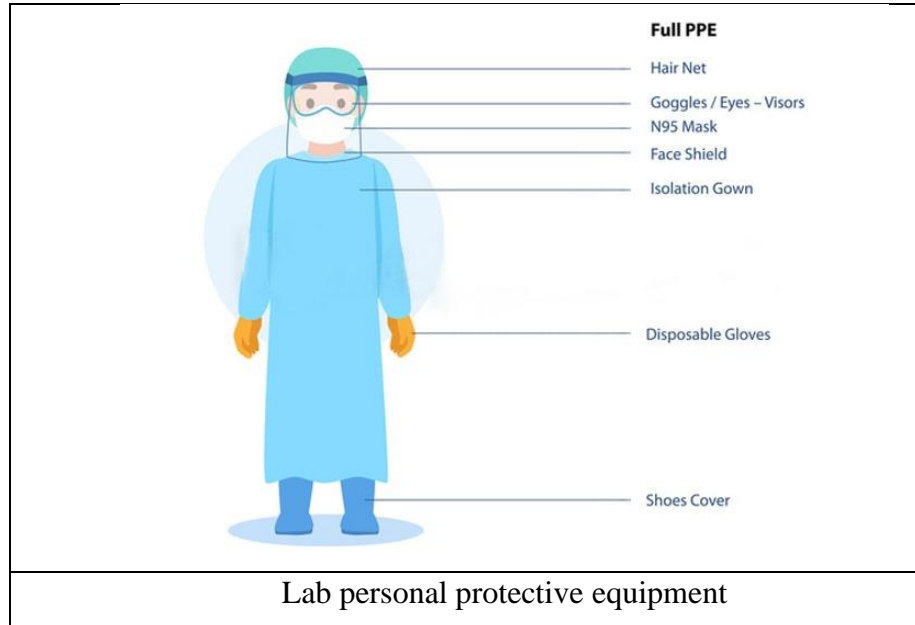
student/students. The first aid kit must be readily available in all labs to avoid any medical mishaps. The kit must be legibly marked as “FIRST AID” along with the safety information sign. If an aspect of the sign gets faded or damaged, it must be replaced. Immediately call the emergency hotline by **dialing 998** once an accident happens. Follow the assistance from your colleagues if necessary, and be calm, composed, and collected since most accidents are not deadly. Avoid giving liquids/medicines to an unconscious person. Don’t self-diagnose and get help from the medical professionals. Emergency contact numbers should also be posted on the walls and corridors of the labs. A written incident report must be sent to the Office of the Laboratory Superintendent when such incidents occur. Lab Incident Report forms are available in the appendix. A simple first aid kit includes, but not limited to the following items:

1. Gauze pads (at least 4 x 4 inches)
2. Two large gauze pads (at least 8 x 10 inches)
3. Alcohol rub (hand sanitizer) or antiseptic hand wipes
4. One package gauze roller bandage at least 2 inches wide
5. Two triangular bandages
6. Wound cleaning agent such as sealed moistened towelettes
7. Scissors
8. At least one blanket
9. Tweezers
10. Adhesive bandages- most commonly used items in first aid kit
11. Latex gloves
12. Resuscitation equipment such as resuscitation bag, airway, or pocket mask
13. Cotton Swab
14. Safety pins
15. Directions for requesting emergency assistance
16. Clinical thermometer

A.	B	C	D
			
<p>First Aid Kits</p>			

3.10. Personal protective equipment (PPE)

Personal protective equipment is regarded as the most essential in Laboratory Safety Standards. Students must be reminded constantly about the use of PPE during any lab session. PPE must not be worn outside the labs as they might be contaminated and become a source of infection.



Dealing with Equipment

Laboratory equipment, such as centrifuges, glassware, hot plate/ stirrers and, incubators are vital parts of any teaching or research laboratory. Selecting and properly maintaining equipment must be part of laboratory procedures. Consider the following when using laboratory equipment:

- Operate and maintain equipment according to manufacturer’s instructions.
- Handle and store glassware with care and dispose of any damaged glassware, according to sharps and glass disposal instructions.
- Ensure that centrifuge rotors are properly balanced.
- Ensure vacuum equipment is trapped or filtered.
- Label equipment appropriately (for example: Do Not Store Volatile Materials in this Box, No Food, and Tinted/Filtered Eye Protection Required to operate this Equipment).
- Laboratory equipment must not be used for human food or beverage preparation or storage.
- Notify Environmental Health and Safety (EH&S) prior to purchasing, installing, or

disposing of the following laboratory equipment:

- biosafety cabinet
- fuel burning equipment
- fume hood
- gas chromatograph with an electron capture device (ECD)
- laser (Class 3B or 4)
- liquid scintillation counter
- nuclear gauge
- refrigerator
- static eliminator
- x-ray and radiation producing devices

4. SAFETY POLICY COMMUNICATION

Safety instructions, guidelines should be communicated through different media e.g. posters, signs, flyers, and manuals. Lab safety signs and posters should be displayed in the main entrances and inside of all labs in strategic locations.

4.1. Sign boards

The following safety information should be provided in a posted signage:

- Exits
- Fire Extinguishers
- Eye Washes
- Chemical and supply storage areas
- Gas Lines
- Specific depositories (e.g. bio-hazardous waste, glass, chemical, garbage)
- Distinguish between potable, non-potable, and deionized water sources
- Diagram of the classroom that includes the location of items listed above
- Emergency plan and phone numbers

Safety signs and signals to be used should include

-Prohibiting signs in round shape complying to ISO 7010 standards



No smoking



Smoking and naked flames forbidden



No access for pedestrians



Do not extinguish with water



Not drinkable



No access for unauthorised persons



No access for industrial vehicles



Do not touch

MANDATORY SIGNS



WARNING SIGNS IN TRIANGULAR SHAPES INCLUDING



EMERGENCY ESCAPE OR FIRST-AID SIGNS (RECTANGULAR OR SQUARE SHAPE)



FIRE-FIGHTING SIGNS



4.2 Safety Posters

It is the means by which safety standards are kept currently remembered in adequate locations and workplaces. They are posted permanently in the lobbies of labs and during awareness campaign and similar events (safety training).

4.3 Labeling – Tagging

Lab instructor should ensure labels are clearly provided for all chemicals (including soap), first aid/biohazard/chemical spill kits and lab supplies. Tag out should be provided for all ongoing testing operations and all locked energized machines and tools.

IV. EMERGENCY PREVENTION – PREPAREDNESS-RESPONSE

The faculty follows the risk management plan:

The closed-loop process of emergency management in labs consists of:

Events driven phases

- Prepare
- Respond
- Recover
- Event independent phase: mitigation/prevention

Emergency Telephones and Posted Telephone Numbers

Every lab should have a clearly marked phone with emergency telephone numbers listed next to it. If there is no phone in the lab, there must be an alternative written plan for contacting emergency or other personnel. This alternative plan must be clearly posted in the laboratory.

Prepare:

- ✓ Students are our assets, and we intend to prepare them in terms of their knowledge, skills and safety attitude for their workplaces.
- ✓ Laboratory safety skills should be the main components of any practical science curriculum. This should clearly define all the laboratory safety rules and regulation.
- ✓ Students must be reminded several times in a semester about safety standards and its policy and procedures.
- ✓ The highest ranked safety item is “PPE” or Personal Protective Equipment.
- ✓ A chemical spill is the most common accident in a science lab, which could occur while dealing with chemicals. It can be cleaned by the lab attendant with minimal effort to avoid any kind of danger.
- ✓ According to the requirements of the OSHA Hazards Communication Standard, the lab attendants must be trained enough to deal with any kind of chemical spill with which they

are working and they must know all the threats associated with the chemical spillage.

- ✓ Any spill, regardless of the amount, must be reported to College Lab Safety Department through the Lab Incident Report form. In case of a chemical spill, all actions must be taken to confine the spill by using absorbent pads.
- ✓ All the available fume hoods must be turned on immediately and all the staff/students should safely leave the area.
- ✓ All victims should meet in a safe area and wait for the emergency response personnel. While waiting, the lab staff should try to retrieve a copy of all relevant Material Safety Data Sheets.
- ✓ All workers who work in college labs must be trained enough to control any chemical spill, and its clean-up operation and disposal.
- ✓ Department will inform the college security officer. The caller should provide information about the spill, especially what chemical was spilled and the amount spilled.
- ✓ All college labs must have cleaning material available all times like absorbent pads, acid/base neutralization chemicals, wipers, drain stoppers, safety shovels, plastic pans & brooms, barricades and warning signs.
- ✓ The faculty and staff must be well informed and trained with the use of all hazardous chemicals available in the college labs.
- ✓ Newly inducted staff must be given an orientation and necessary training on how to deal with emergency situations in the lab. The instructor conducting any lab activity is fully responsible for the required education and training of the staff and students about lab safety standards and operating procedures.
- ✓ Furthermore the following points should be kept in mind:
 - Cleanse up every small spills instantaneously. If the observed spill is humongous and is presumed to lead to a major risk to others in the laboratory, immediately finish the process or device if practicable, and summon some expert for support.
 - If in any case evaporative, combustible, or noxious solvent spills off, close down flames and spark-emanating devices immediately and leave the workspace and summon one of the expert staff for support who can deal with such situation.
 - In the matter of fire or flares, call some expert for help & support.
 - Keep a clear track to all safety devices at every time.

Emergency Equipment and Facilities

Emergency equipment and facilities includes:

- Emergency Telephones and Posted Telephone Numbers
- Showers and Eyewash Stations
- Chemical Spill Control Equipment
- Fire Alarm System
- Fire Extinguishers
- Fire Blankets
- First Aid Kit

Emergency conditions:

1-Fire

Type	Effective Against	Do Not Use On
Water	Class A fires: burning paper, wood, coal, rubber, textiles	Electrical, liquid or metal fires
Carbon Dioxide	Class B fires: petroleum hydrocarbons (flammable solvents, motor oil, grease)	Metal fires (including lithium aluminum hydride)
Dry Powder or Dry Chemical	Class C fires: burning liquids, large quantities of flammable solvents, electrical fires	Metal fires, fires involving delicate instruments
Met-L-X and other Class D extinguishers with special granular formations	Class D fires: burning metal (e.g. lithium, magnesium, potassium, sodium, alloys of reactive metals, metal hydrides, metal alkyls, and other organometallics)	Paper, trash, liquid, electrical fires
Halon Substitute fire extinguishing	Class A, B, and C fires	Class D fires

2-Burn

In case of a chemical burn, do the following steps:

- Quickly wash the affected area with plenty of water.
- Use the shower to wash the burnt area slowly and avoid washing it with high pressure water.
- Cut the clothing, but never pull the clothing to avoid further injury since burnt

clothing may be stuck to the affected area.

- If the hands, legs, or feet of a student get burnt, raise them above the heart level.
- Don't try to neutralize the chemicals as this may cause further injury due to chemical reactions.
- Apply some clean, dry, and loose dressing over the affected area.
- Call the **emergency hotline 998** for medical assistance.

3-Mercury –a poisonous material



Handling mercury spills: Mercury is a poisonous material and students must be careful dealing with mercury or mercury containing apparatus in the labs. When this element spills, it breaks into beads instead of clumping in puddles. These beads are very small and difficult to handle.

Properly labeling the equipment and containers helps to prevent accidents. All work involving mercury must be done in a tray to contain possible spills.

- A mercury spill must be cleaned quickly.
- Mercury is unlike the usual liquids. If you try to clean the spill with regular absorbents, you could make the spill worse by spreading it.
- A special mercury spill kit must be used to control the spill following the instructions included in the kit
- Any lab incident must be documented and a copy of lab incident report must be sent to the CLSD (College Lab Safety Department).

4- In case of sever windstorm/sandstorm

- All the students must be informed and trained of what to do in case of severe weather conditions.
- Generally, stay away from windows, doors, outside walls and protect your head.
- Use a face mask to help breathe properly.
- After the severe weather emergency passes, the faculty/staff should notify the proper emergency personnel of any damages or injuries by calling 998
- All college damages or injuries must be reported through the Lab Incident Report Forms.

5. Other emergency conditions:

Accident	Emergency procedures
Puncture wounds, cuts and abrasions	The affected individual should remove protective clothing, wash the hands and any affected area(s), apply an appropriate skin disinfectant and seek medical attention as necessary.
Broken containers and spilled infectious substances	Broken containers contaminated with infectious substances and spilled infectious substances should be covered with a cloth or paper towels. Disinfectant should then be poured over these and left for the appropriate amount of time. The cloth or paper towels and the broken material can then be cleared away; glass fragments should be handled with forceps. The contaminated area should then be swabbed with disinfectant. If dust pans are used to clear away the broken material, they should be placed in an effective disinfectant. Cloths, paper towels and swabs used for cleaning up should be placed in a contaminated-waste container. Gloves should be worn for all these procedures. If laboratory forms or other printed or written matter are contaminated, the information should be copied onto another form and the original discarded into the contaminated-waste container.
Ingestion of potentially infectious material	Protective clothing should be removed, and medical attention sought.

V. MAINTAINANCE, and INSPECTION

Maintenance

All equipment used in the laboratory must function properly and safely. To ensure this, laboratories must maintain equipment according to a manufacturer's specifications or established guidelines, and perform routine inspections for common problems: corrosion, damaged electrical cords, excessive contamination, leaks, worn parts, and ensure that alarms, guards, interlocks, or other safety devices have not been disconnected or disabled. The college has policies for maintenance of equipment, and usage

Inspection

- ✓ The following equipment will be inspected & Surveyed by Laboratory personnel and report any issues to head of department.
- ✓ biological safety cabinets at least once a year if used for biosafety level 2 and after moving or repair (at researcher's expense)
- ✓ fire extinguishers (inspected monthly by safety department personnel)
- ✓ fume hoods (annually)
- ✓ safety showers (tested by annually)

Disposal

Working and non-working laboratory equipment must be free of contamination and inspected by lab technician prior to disposal. Laboratory Equipment Disposal Form is used

General rules for wastes disposal

Material	Method of disposal
Biological liquids (not in test tubes)	Leave in container with closed cap and leave in the area designated for materials that are to be decontaminated by autoclaving.
Biological liquids in test tubes	Place tube upright in indicated test tube rack with caps left on the tube
Broken glass	disposed in hazardous Sharps container
Needles, syringes, other types of sharps	disposed in hazardous Sharps container
Noncontaminated paper	Regular trash
Contaminated solids (other than swabs)	Biohazard “orange/red bag” container
Agar slants with biological material	Place tube upright in indicated test tube rack
Biological liquids (not in test tubes)	Leave in container with closed cap and leave in the area designated for materials that are to be decontaminated by autoclaving.
Petri dishes and contaminated solids (other than pipettes or swabs)	Biohazard “orange/red bag” container
Transfer pipettes (contaminated)	discarded in benchtop discard can containing disinfectant, Pipettes are disposed of tip side down.
Chemicals solutions and powders	Chemicals wastes should be discarded in their specified containers which will prevent their interaction and possible explosion (per chemical waste disposal instructions in each lab)

VI. LABORATORY SPECIFIC TRAINING

All laboratory personnel, including students, must have training on the followings topics:

- location and content of the *Laboratory Safety Manual*
- physical, chemical, biological, laser, and radiation hazards in the work area, including signs and symptoms of exposure and allowable exposure limits, using applicable safety data sheets (SDS) content
- Location of references describing hazards and safety practices associated with laboratory materials (Biosafety in Microbiological and Biomedical Laboratories, Merck Index, and SDS, etc.)
- Protective measures necessary to avoid exposure or injury, as specified in the laboratory's Standard Operating Procedures
- Procedures for responding to laboratory emergencies (chemical spill(s), fire, severe weather, etc.) as outlined in the laboratory's Emergency Action Plan
- Methods to detect the presence of contamination or the release of chemical, biological and radiological materials
- Procedures for obtaining medical care in the event of exposure/injury
- Proper waste management and disposal procedures
- Proper record keeping Document laboratory-specific training on the Site-Specific Training form.
- Training of each lab personnel is recommended every three years. And, a supervisor must carefully monitor employee.
- Departments and/or laboratory supervisors must maintain safety training records for all laboratory personnel. Acceptable records include

VII-Laboratory related policies:

1- Policy-of-Laboratories-Using-Maintenance-and-Calibration

1- Purpose:

1-1 To provide the optimum usage of laboratories in Faculty of Medicine.

1-2 To provide the extent of effectiveness of equipment found in these laboratories.

2- Scope:

- This policy is applicable to staff members, students, and agreed researchers in Faculty of Medicine, NBU.

3- Responsibility:

- Heads of departments.
- Teaching staff using laboratories (Faculty of Medicine and Faculty of Applied Science)
- Coordinator of laboratories in Male and Female sections.
- Technicians.
- Vice deanship of academic affairs.
- Information Technology employee
- Maintenance and Safety officer.

4- Customer

- Internal customers (Students and staff members in the Faculty of Medicine).
- External customers (Student and staff members from other sector and researchers other than Faculty of Medicine or Faculty of Applied Science).

5- Inputs:

- List of inspection and measuring equipment for all laboratories in the faculty.
- Identification card for each equipment.
- Operation manual and calibration for equipment.
- Standards of NCAAA 2018

6- Procedure:

6 - 1 Preparing laboratory Portfolio that contains the following:

- Condition assessment.
- Shared used.
- Report on working hours.
- Identification card for equipment.
- Capacity of laboratory (number of student).
- Safety measures.
- First Aid box.
- Biohazard discharge.

6 - 2 Laboratory Quality manual that contains the following:

- List of inspection and measuring equipment.
- Operation manual, Instruction manual.
- Calibration reports
- Testing standards (if present)

6 - 3 Mechanism for shared use of laboratories between Faculty of Medicine and any other Collegewith defining the responsibilities of each.

6 - 4 Condition assessment of laboratories daily inspection of refrigerator temperature (identified electric problem immediately) and monthly report about laboratories (express number of student in certain time, arrangement, clearing and presence of staff

member) annual report about allocated of equipment (by year to add new equipment that inter from purchasing department).

- 6 - 5 Maintenance Unit/ officer should check all the equipment of safety regarding availability, expiry, suitability for use..etc. Also, the instructions for usage for every equipment should be provided continuously.
- 6 - 6 Training to students and teaching staff should be conducted before starting use of any equipment in the laboratories
- 6 - 7 Laboratories portfolios should be fulfilled regularly. Any complaints should be raised to the Head of Technical Affairs for repairing and follow-up.
- 6 - 8 Calibrations of all equipment should be done regularly (according to the special regulation of each equipment) and recorded in the laboratory portfolio

7- Outputs:

- Inventory of equipment.
- Laboratory safety manual.
- Quality manual for the laboratory.
- Laboratory portfolio.

8- KPIs:

At least 80% of students satisfied with the usage of the laboratory.

At least 70% of staff members satisfied with the usage of the laboratory.

2- Equipment using policy:

1- Purpose:

The purpose of this policy is to determine the effectiveness of using the equipment and learning resources in the Faculty of Medicine.

2- Scope:

This policy is applicable to the used leaning resources such as the laboratory equipment, computer and skill labs, research and other resources as well as other materials within the Faculty of Medicine.

3- Responsibility:

- 3.1 Vice-deanship for Academic Affairs
- 3.2 Head of Education resources and E-Learning
- 3.3 Head of Research Unit
- 3.4 Course Coordinators
- 3.5 Faculty Manager
- 3.6 Head of administration affairs
- 3.7 Supervisors and officers of the different labs and premises

4- Customer:

Internal: Staff members, students and researchers

External: Researchers and common users from outside the faculty

5- Inputs:

- Internal by-laws of the faculty
- The Teaching and Learning loading and usage of the different equipment
- The agreed research plans
- The agreement with the External faculties and Institutes and the mutual responsibilities

6- Procedure:

- 6 - 1 A complete agenda from the Unit of Curriculum Implementation, Research Unit, and External Faculty or Institutes is collected before the end of scholar year.
- 6 - 2 Based on the provided data, a complete schedule for the next semesters is established to include
 - The premise and place utilized and course coordinators
 - The type and identification of the equipment used
 - The number of used equipment in hours on a weekly basis
 - The determined responsibilities between faculties
- 6 - 3 The schedule is signed by all custodians of the place and equipment used
- 6 - 4 The schedule is reported to the Vice-Dean for Academic Affairs for final approval
- 6 - 5 The supervisors post the approved schedule at the entrance of each facility to be legible to all coordinators and students
- 6-6 Coordinators are responsible for the supervision of the student usage of the equipment
- 6 - 7 In case an equipment is out of order or erroneous for any reason, the coordinator reports the defect to the custodian to take the necessary corrective actions
- 6 - 8 The custodians record the actual timing of the usage against the planned duration
- 6 - 9 By the end of each week a report is established as to the actual against usage time.
- 6 - 10 For researches, the principal researcher records the actual usage of the needed equipment as well as the used materials and tools as separate records with the dates to be reported to the Vice-Dean for Academic affairs and the Head of Research Unit.
- 6 - 11 Other usages are recorded by those assigned in the agreement to be reported to the Vice-Dean for Academic affairs on as used basis with the equipment, materials and tools used.
- 6 - 12 A maintenance schedule is planned and implemented according to the provided manufacturer manuals and demonstrated on annual maintenance plan
- 6 - 13 Further analyses are performed by the Head of Learning Resources Unit to demonstrate the effectiveness of equipment usage and to determine the over-usage, under-usage or even usage of the equipment to decide the rebalance of planning and provision of extra equipment or the disposition of the under-used facilities.

7- Outputs:

- Records of actual against planned equipment usage
- Analysis of the actual usage and further dispositions

8- KPIs:

- The Maintenance Plan of the equipment and premises
- Percentage of actual against planned usage (effectiveness)

9- Forms:

- The maintenance plan
- The actual against planned records

VIII-Lab –related forms:

1-INCIDENT REPORT (by faculty member)

Please use this form to report any laboratory incidents/accidents. Fires should also be reported, particularly when fire extinguishers are discharged.

Name of Person involved in this incident: _____

Put a tick:

Instructor: _____ Student: _____ Laboratory Staff: _____ Housekeeping Staff: _____ Maintenance Staff: _____
Visitor/other: _____

Instructor Name: _____ Contact No: _____

State your location at time of incident: _____

Location of Incident: _____ Date/Time of incident: _____/_____/_____ Number
of students in lab at time of accident: _____

Personal Protective Equipment being used: Yes ___ No ___

How did the incident come to your attention?

_____ I was involved

_____ Reported to me

_____ Others: _____

(A) First Aid

- Wash
- Burn spray
- Band-aid
- Eye wash
- Other

(B) Treatment

- Sent to hospital
- Requested ambulance
- Note Time help arrived: _____

(C) Clean up

(D) Fire extinguisher

(E) Evacuation

Details of Incident: (nature of incident, e.g., illness, accident, injury or chemical spill).

Indicate any substances (e.g., amount and kind of chemical) or objects involved.

Name/Signature: _____

2- SHARP INJURY REPORT

To Be Filled by The Faculty Member

Please use this form to report any laboratory incidents/accidents. Fires should also be reported, particularly when fire extinguishers are discharged.

Name of Person involved in this incident: _____

Put a tick

Instructor: _____ Student: _____ Laboratory Staff: _____ Housekeeping Staff:
_____ Maintenance Staff: _____ Visitor/other: _____

Instructor Name: _____ Contact No: _____

State your location at time of incident: _____

Location of Incident: _____ Date/Time of incident: _____/_____/_____

Number of students in lab at time of accident: _____

Personal Protective Equipment being used: Yes ___ No ___

How did the incident come to your attention?

_____ I was involved

_____ Reported to me

_____ Others: _____

(C) First Aid

- Wash
- Burn spray
- Band-aid
- Eye wash
- Other

(D) Treatment

- Sent to hospital
- Requested ambulance
- Note Time help arrived: _____

(C) Clean up

(D) Fire extinguisher

(E) Evacuation

Encircle the Required Field

Type Of Injury/Exposure

- ✓ Needle stick
- ✓ Lancet/blade/knife
- ✓ Glass
- ✓ Blood/Other body fluid _____

Involved Body Part

- ✓ Arm/hand
- ✓ Face/Neck/Head
- ✓ Leg/Foot
- ✓ Other body part: _____

Exposure Occurred

- ✓ Before use of the sharp
- ✓ After use of the sharp
- ✓ During use of the sharp

Prior Vaccines Received: Tetanus/Date: _____ HEP A/Date: _____ HEP B/Date: _____ Did the vict

Brief description of exposure/injury: Indicate circumstances and who was involved.

(Back of the page may be used if necessary to write the details) _____

Called the Medical help?/Details with time help arrived _____

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جامعة الحدود الشمالية
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كلية الطب

