



SBUMS

Laboratory Safety Guideline and Waste Management Manual School of Medicine

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This manual is designed to enhance the safety and efficiency of laboratory operations by promoting responsible waste management practices. Its primary goal is to ensure the safe handling, segregation, collection, and disposal of laboratory waste while minimizing environmental impact and complying with institutional and regulatory standards.



A top-down view of a laboratory setting. In the upper half, there are three petri dishes with light blue agar media. Some dishes show small, dark, circular colonies. Between the dishes are two small, red, cylindrical objects, possibly microcentrifuge tubes. On the left side, a gloved hand is visible, holding a white, U-shaped object. On the right side, a pink and blue pipette tip is visible. The background is a plain, light-colored surface.

Laboratory Waste

Infectious Waste

Includes materials contaminated with blood, body fluids, biological cultures, pathology specimens, and other potentially infectious substances.

Disposal Guidelines:

- Blood, serum, urine, and other body fluids must be stored in leak-proof containers until collected.
- Contaminated plates and culture media must be discarded in yellow biohazard bags.
- All infectious waste is transported weekly to Taleghani Hospital for autoclaving and proper disposal.



Sharps Waste

Includes needles, broken glass, scalpel blades, and other items capable of puncturing or cutting the skin.

Disposal Guidelines:

- All sharps must be disposed of in puncture-resistant containers (Safety Boxes).
- When the container is three-quarters full, it must be sealed and transported to Taleghani Hospital for autoclaving and final disposal.



Chemical and Pharmaceutical Waste


Includes unused or leftover reagents and chemical solutions used in laboratory testing.

Disposal Guidelines:

- Dispose of chemicals in accordance with the manufacturer's instructions on the reagent container.
- Empty reagent containers should be treated as infectious waste and discarded in yellow biohazard bags.

Waste Separation and Collection Procedures

- Infectious and chemical waste must be placed in yellow bins lined with yellow biohazard bags.

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- Sharps waste must be disposed of in Safety Boxes, sealed once they are two-thirds full.
 - Non-contaminated general waste should be placed in blue bins or black heavy-duty garbage bags.

Collection Protocol:

- Waste containers must be securely sealed when they reach three-quarters capacity.
- Waste is collected weekly in accordance with university waste management schedules.
- All waste receptacles must be cleaned and disinfected immediately after each waste removal cycle.



Safety and Hygiene Precautions

- All personnel involved in waste handling must wear appropriate personal protective equipment (PPE) including gloves, masks, protective clothing, and sturdy, closed-toe footwear.
- Compacting waste is strictly prohibited. All waste bags must be securely tied prior to removal.
- Color-coding of waste bags must be strictly followed:
- Yellow bags for infectious and chemical waste
- Black bags for non-hazardous waste
- Waste containers must be durable, washable, leak-proof, and equipped with lids.
- Prevent any leakage during the transportation of waste materials.




By adhering to these guidelines, all laboratory staff and students contribute to a safer work environment and help ensure the university's commitment to public health and environmental responsibility.





Warning and Hazard symbols in the lab

These signs/symbols indicate some possible threats in that area. If you see such symbols, you must be alert and take extra care while working in such a zone. It is better to be properly instructed to work in areas with these symbols.



Biological Hazard: Different levels



Biological Hazard		Presence of Biohazardous materials
Biosafety Level 1		Presence of biosafety level 1 (Risk Group 1) organisms. (Presence of organisms that usually don't cause disease in healthy adults but are capable of causing infections, have a minimum potential hazard to environment and laboratory personnel, and have effective treatment measures.)
Biosafety Level 2		Presence of biosafety level 2 (Risk Group 2) organisms. (Presence of organisms capable of causing mild infections, having moderate potential hazard to the environment and laboratory personnel, difficult to spread forming aerosol, and having effective treatment/preventive measures.)

Biosafety Level 3		<p>Presence of biosafety level 3 (Risk Group 3) organisms.</p> <p>(Presence of organisms capable of causing severe infections and spreading via aerosol. They have high individual risk and moderate community risk with some treatment and prevention measures available.)</p>
Biosafety Level 4		<p>Presence of biosafety level 4 (Risk Group 4) organisms.</p> <p>(Presence of organisms having a high potential of causing serious infection to individuals and communities. They have a very high transmission rate and have no available treatment and preventive measures.)</p>

Chemical hazard symbols in the lab




These symbols represent the presence of specific chemical substances/ substances with the potential to harm humans or any other living objects.



Name of Symbol	Symbol	Indication	Properties	Safety Warnings
Poison/ Poisonous Materials	 Poison	Presence of toxic materials	- Can cause severe injury or death if inhaled, swallowed, or absorbed through the skin.	<ul style="list-style-type: none">- Avoid inhaling gases or vapors.- Prevent direct skin and eye contact.- Always wear protective gloves and clothing.- Eating, drinking, and smoking near these substances are strictly prohibited.
Carcinogenic	 Carcinogenic	Presence of carcinogenic materials		




<p>Corrosive Material Hazard</p>	 <p>Corrosive</p>	<p>Presence of corrosive substances</p>	<ul style="list-style-type: none"> - Can cause severe burns to the skin and eyes upon contact. - Inhalation may damage respiratory tissues. 	<ul style="list-style-type: none"> - Store acids and bases separately. - Avoid inhaling fumes. - Prevent direct skin and eye contact. - Always wear protective gloves and clothing.
<p>Harmful Irritants</p>	 <p>Harmful Irritants</p>	<p>Presence of harmful chemicals causing irritations</p>		




Physical material hazard symbols in the lab




These symbols represent the presence of a specific substance, condition, or factor with the potential to harm humans or any other living objects in contact with them. Physical hazards may be physical conditions like heat, cold, pressure, vibration, etc., sound, radiation, and electricity.

Name of Symbol	Symbol	Indication	Properties:	Safety Warnings
High Voltage		Supply of high-voltage electricity		
Electric Hazard		Risk of getting electric shock. (The device might give mild to severe electric shock.)		
Cryogenic Hazard		Low-temperature zone		

Flammable Material	 Flammable Material	Presence of combustible materials (a substance that can easily burn)	<ul style="list-style-type: none"> - Contact with heat, sparks, or flames can cause burns or explosions. - Flammable materials ignite at room temperature, while combustible materials burn when heated. 	<ul style="list-style-type: none"> - Keep away from oxidizing agents and combustible materials. - Store away from heat, sparks, and flames. - Smoking is strictly prohibited near these substances.
Oxidizing Material	 Oxidizing Material	Presence of oxidizing chemicals	<ul style="list-style-type: none"> - Can accelerate combustion and cause explosions by releasing oxygen. - May cause severe burns to the skin and eyes upon contact. 	<ul style="list-style-type: none"> - Keep away from flammable and combustible materials. - Store away from heat and ignition sources. - Always wear protective gloves and coverings.




Explosive Material	 <p>Explosive Material</p>	<p>Presence of explosive and/or self-reactive substances</p>	<ul style="list-style-type: none"> - May be unstable and react dangerously due to shock, pressure, heat, or light exposure. - Can burn, explode, or release toxic gases when mixed with incompatible materials. 	<ul style="list-style-type: none"> - Keep away from heat sources. - Avoid shaking or friction. - Always wear protective coverings and equipment.
Hot Surface	 <p>Hot Surface</p>	<p>Risk of burning if you touch with naked hands</p>		
Laser Hazard	 <p>Laser Hazard</p>	<p>Presence of laser radiation</p>		

<p>Ionizing Radiation (Radiation) Hazard</p>		<p>Presence of radioactive materials emitting ionizing radiation or the presence of electromagnetic waves having the capacity to ionize an atom</p>		
<p>Non-ionizing Radiation Hazard</p>		<p>Presence of electromagnetic waves that don't have ionizing capacity but have the capacity to excite electrons</p>		
<p>UV Radiation Hazard</p>		<p>Presence of UV light</p>		


Glassware Hazard	 Glassware Hazard	Presence of broken glasses		
General Warning	 General Warning	Presence of possibly hazardous materials/ environment		
Health Hazard	 Health Hazard	Presence of chemical, physical, or biological factors with the potential to have a negative effect on our health		

Entry/Working requirement symbols in the lab

These symbols indicate what must be done before entering or working in the zone. They indicate what personal protective equipment must be used by personnel intending to do a specific job in a particular area.




Name of Symbol	Symbol	Indication
Gloves Required	 Gloves Required	Must use protective gloves in this area/while working in this area
Safety Glasses Required	 Safety Glasses Required	Must use protective/safety goggles in this area/while working in this area
Safety Shoes Required	 Safety Shoes Required	Must use closed-toe shoes in this area/while working

<p>Lab Coat Required</p>	 <p>Lab Coat Required</p>	<p>Must wear lab coat (apron) while in this area</p>
<p>Protective Clothing Required</p>	 <p>Protective Clothing Required</p>	<p>Must wear full protective clothing</p>
<p>Respirator Required</p>	 <p>Respirator Required</p>	<p>Must wear a breathing mask/ respirator; the presence of contaminated air</p>
<p>Face/Safety Mask Required</p>	 <p>Face Mask Required</p>	<p>Must wear face/dust/safety masks</p>

Face Shield Required	 Face Shield Required	Must wear face shield while working
Hair Protection Required	 Hair Protection Required	Must wear hair protection before working
Hearing Protection Required	 Hearing Protection Required	Must wear a hearing protection device while working

Different stations symbols in the lab

These symbols specify a location/station where a specific task is expected to be performed. You must only do the work represented by the symbol, but not any other tasks that can be done with the available materials (for instance, you must not wash your hand in the eye washing station).

Name of Symbol	Symbol	Indication
Hand Wash Station	 Hand Wash Station	Place to wash your hands.
Eye Wash Station	 Eye Wash Station	Place to wash your eyes.
Shower Station	 Shower Station	The place to take a shower

**Hand Sanitization
Station**



Hand Sanitization Station

The place to sanitize your hand

**Emergency Meeting
Station**







Emergency Meeting Station

The place for all lab personnel to
meet for an emergency meeting
or during emergency

Location symbols of a specific object in the lab




These symbols indicate the location of specific materials/devices for use on specific occasions. It includes first aid boxes, fire extinguishers, fire blankets, alarm systems, etc.

Name of Symbol	Symbol	Indication
Fire Extinguisher	 Fire Extinguisher	The location where the fire extinguisher is placed
First Aid	 First Aid	The place with the first aid box and materials
Drinking Water	 Drinking Water	Indicates safe water for drinking

<p>Fire Blanket</p>	 <p>Fire Blanket</p>	<p>The location where the fire blanket is placed</p>
<p>Fire Hose</p>	 <p>Fire Hose</p>	<p>The location where the hose with water or any fire retardant is placed</p>
<p>Emergency Bell</p>	 <p>Emergency Bell</p>	<p>Bell to be pressed during an emergency like fire or accident.</p>

Prohibition symbols in the lab

These symbols indicate what actions or objects are not permitted to do or carried within the specific area. These symbols are usually a figure crossed with a red mark.

Name of Symbol	Symbol	Indication
Restricted Entry	 Restricted Entry	Entry is allowed for authorized personnel only
Food and Drink Prohibited	 Food and Drink Prohibited	Not allowed to eat or drink anything in this area
No Open Flame	 No Open Flame	Don't use an open flame in this area; the presence of highly flammable or temperature-sensitive materials.

No light	 No light	Maintain dark, photo-sensitive materials.
No Open Shoes	 No Open Shoes	Not allowed to wear open-toe shoes
No Open Hair	 No Open Hair	No open hair allowed while working here
No Electronics	 No Electronics	Not permitted to use/take any electronic devices
No Gloves	 No Gloves	Gloves must be removed.



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