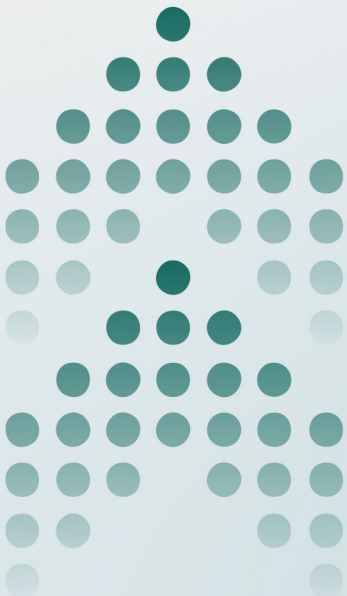
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Saudi Contractors Authority

National Council for
Occupational Safety & Health



Guideline for Occupational Safety and Health in Laboratories

september 2026




بسم الله الرحمن الرحیم



Introduction

Laboratories are work environments that may involve a range of potential hazards, including chemical, biological, and radiological materials; handling hazardous substances that may affect the respiratory system; and the use of various laboratory equipment and instruments. Failure to comply with safety procedures may result in injuries, incidents, or fatalities within the laboratory.

Therefore, the implementation of occupational safety and health practices in laboratories contributes to reducing potential risks, protecting personnel, and maintaining a safe and healthy work environment. Compliance with safety procedures also enhances work efficiency and helps minimize incidents, fatalities, and occupational injuries.

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Purpose of the Guide

This guide aims to:

- Raise awareness of occupational safety and health procedures in laboratories.
- Identify potential hazards in laboratory environments and outline preventive measures.
- Support establishments in implementing safe work practices within laboratories.
- Promote a culture of safety among laboratory personnel.
- Reduce accidents, fatalities, and occupational injuries associated with laboratory activities.

Target Audience

This guide is intended for the following groups:

- Laboratory personnel.
- Occupational safety and health officers.
- Laboratory supervisors and managers.
- Laboratory technicians and researchers.

Laboratory Safety and Preparation Standards

Before commencing work in the laboratory, it is essential to ensure that the work environment is ready and that the following safety standards are observed:

- Ensure that the work area and laboratory tools are clean and well organized.
- Inspect devices and equipment to verify that they are functioning properly and are fit for use.
- Confirm the availability and readiness of personal protective equipment, and conduct the necessary fit or suitability checks before use.
- Ensure that fire-fighting equipment is available and that emergency exits are clearly marked and easily accessible.
- Review the Safety Data Sheets (SDS) of materials before handling them.
- Ensure the availability of designated containers for chemical, biological, radiological, and sharps waste.
- Ensure the availability of protection against electrical hazards.

Ensure familiarity with emergency procedures and the locations of first aid equipment.

Types of Laboratory Hazards

Hazards include:

- Chemical hazards.
- Biological hazards.
- Radiological hazards.

- Hazards associated with inhalation of fine particles.
- Physical hazards.
- Electrical hazards.
- Fire and explosion hazards.
- Ergonomic hazards.

Laboratory Safety Procedures

- Comply with laboratory safety instructions.
- Use appropriate personal protective equipment.
- Read the Safety Data Sheets (SDS) of materials before use.
- Store materials in accordance with the requirements stated in their Safety Data Sheets(SDS).
- Maintain cleanliness and order within the laboratory work environment.
- Do not eat or drink inside the laboratory.
- Dispose of laboratory waste in accordance with approved procedures.
- Use laboratory equipment properly and safely.
- Ensure good indoor air quality inside the lab.

Personal Protective Equipment (PPE) in Laboratories

Includes:

- Lab coat.
- Gloves.
- Safety goggles.
- Respiratory protection equipment.
- Safety shoes.

PPE must be selected based on the type of activity and associated risks.

Safe Handling of Materials

- Follow instructions provided in the Safety Data Sheet (SDS).
- Ensure compliance with the HAZCOM/HAZMAT principles.
- Use a fume hood when required.
- Store materials in designated storage containers, ensuring that they are properly grounded and connected to the appropriate ventilation or fume control system, where required.

Safety When Using Equipment and Devices

- Ensure equipment is safe before operation.
- Use equipment according to instructions.
- Do not tamper with equipment.
- Disconnect devices after use.
- Conduct periodic maintenance.

Handling Chemical Spills

- Isolate the affected area immediately.
- Wear appropriate PPE.
- Use suitable absorbent materials.
- Clean the spill according to procedures.
- Dispose of waste safely.

Biological Safety

- Handle biological samples with caution.
- Use biological safety cabinets when necessary.
- Dispose of biological waste safely.
- Sterilize tools and surfaces.

Laboratory Waste Management

- Dispose of materials safely according to their type.
- Use designated waste containers.
- Apply warning labels.
- Dispose of waste according to approved regulations and procedures.

Emergency Response

In the event of an emergency in the laboratory, the following procedures should be followed:

- Notify the supervisor or safety team immediately.
- Stop laboratory work when necessary.
- Use emergency equipment (fire extinguishers, emergency showers, eyewash stations).
- Evacuate the area if there is a risk to personnel safety.
- Contact emergency services when needed.

First Aid

In the event of an injury inside the laboratory, appropriate first aid should be provided until specialized medical care arrives:

- Wash the affected area according to procedures in case of chemical exposure.
- Use medical dressings for minor wounds.
- Cool burns with cold water.
- Transfer the injured person to a medical facility if necessary.
- Refer to the SDS.

Training and Awareness

- Train personnel on laboratory safety procedures.
- Provide training on handling hazardous materials.
- Train on emergency response and spill management.
- Provide awareness, training, and testing for proper use of PPE.
- Inform workers about the locations of emergency equipment inside the laboratory.

Common Mistakes to Avoid

- Failure to use personal protective equipment.
- Improper storage of materials.
- Handling unknown materials.
- Using laboratory equipment without training.
- Not reading safety instructions before handling hazardous materials.
- Neglecting spill cleanup or improper waste disposal.

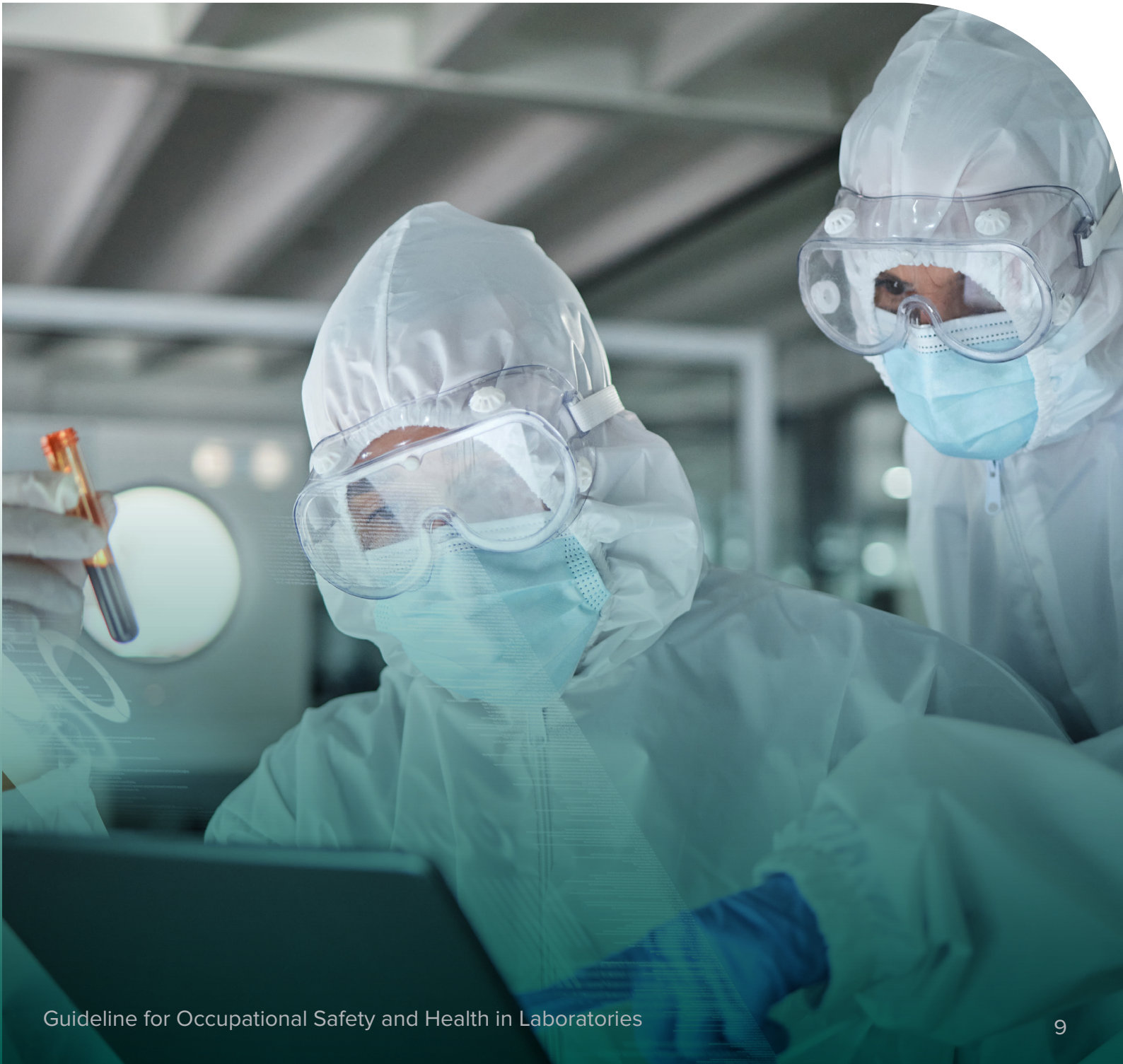
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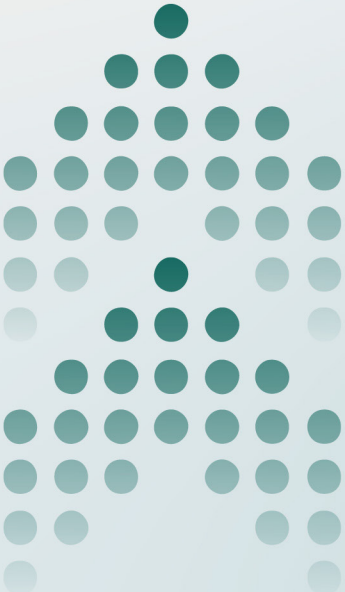
Conclusion

Occupational safety and health in laboratories are essential elements for ensuring a safe and healthy work environment.

Compliance with safety procedures and the use of appropriate protective equipment help reduce occupational risks and protect laboratory personnel.

Promoting a safety culture and providing continuous training for personnel also contribute to raising awareness and reducing incidents, fatalities, and injuries associated with laboratory activities.







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