

DEPARTMENT OF HEALTH REHABILITATION SCIENCES

LABORATORY SAFETY MANUAL

COMPILATION
REVISED 2024

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This manual is designed as an addendum to the Student Handbook to ensure the safety and well-being of the students and personnel using the laboratory in the Department of Health Rehabilitation Sciences-Physical Therapy Program. Adherence to the safety measures stipulated herein intends to prevent and manage incidents related to laboratory hazards

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PREFACE

Welcome to the Physical Therapy Laboratory Safety Manual. This is designed to provide guidelines and procedures to ensure the safety of individuals working here.

The physical therapy laboratory is a workplace where various hazards can be encountered daily. However, the laboratory can be a safe place to work and learn whenever potential hazards are identified and safety protocols are followed.



Fire is the most common serious hazard that you could face inside the physical therapy laboratory due to the presence of several electrical devices. Adherence to proper procedures and training can minimize the chances of an accidental fire.

This manual is intended to:

- (1) Describe the potential laboratory safety hazards and protective mechanisms associated with each of the following categories:
 - (a) Electrical
 - (b) Fire
 - (c) Equipment
 - (d) Chemical
- (2) Define safety rules for the clinical laboratory, including proper personal habits, housekeeping practices, and laboratory techniques.
- (3) Describe proper guidelines and protocols for prevention and management in the event of untoward laboratory-related accidents.

Furthermore, the department annually conducts the laboratory safety orientation program, during the first opening week of the academic year. Refer to the lab safety informed consent form in the link below:

https://docs.google.com/document/d/1J4PGVN_kGoTPahQaEHTZ8mdLdGxPyTWd/edit?usp=sharing&oid=105892929441117328514&rtpof=true&sd=true

This laboratory safety manual has been reviewed, revised, and approved dated: _____, for immediate implementation.

Head
Department of Health Rehabilitation Sciences

Section I:

GENERAL SAFETY GUIDELINES

A. Introduction

We all have the responsibility to maintain a constant concern for safety in the laboratory. *Good personal habits, housekeeping practices, and laboratory technique* can all help ensure that the laboratory is a safe place to learn and work.

B. Laboratory Dress Code Policy

- (1) Physical therapy students, staff, and faculty are required to dress according to the standards established in the policy by the Faculty of Applied Medical Science (FAMS). Everyone is encouraged to wear professional attire while participating in physical therapy courses (e.g., medical scrubs).
- (2) Shorts and open-toed, open-heeled, perforated, mesh, or canvas shoes are strictly NOT acceptable in the laboratory.
- (3) Laboratory coats, if instructed, must be worn in the teaching laboratory, regardless of the activity. This includes, but is not limited to, lecturing in the laboratory area, practicing manual exercise during scheduled laboratory sessions, studying in the laboratory outside of scheduled laboratory sessions, etc.

Laboratory coats must be fully buttoned, clean and in good repair. They must be not be worn outside of the laboratory.
- (4) Legs must be covered to avoid skin contamination or injury from pathogens, chemicals, or reagents. Shorts and Capri pants are not allowed. Skirts and dresses are permitted if they cover the legs. Leggings and hosiery (nylons) are

discouraged as they can retain spills against the skin, causing prolonged exposure and /or injury

(5) Shoes should be comfortable, water-repellent, and must enclose the entire foot.

To avoid injury to the feet from items dropped or spilled, no open-toed, open-heeled, perforated, mesh, or canvas shoes are allowed. Nonskid, flat-soled shoes should be worn to prevent possible serious injuries from falls.

(6) Hats are not allowed. Hats with a brim that obscures the eyes are not allowed.

Other headgear, such as beanies, scarves, headbands, etc., may be worn if they are tied back, do not pose a danger of being caught in equipment or being contaminated with specimens or reagents, and do not cause distractions.

(7) Long, dangling jewelry is not permitted in the laboratory.

(8) Long hair and beards must be tied back in such a way as to avoid interference with laboratory equipment.

(9) Sunglasses and other darkly tinted eyewear are not allowed.

(10) Fingernails must be trimmed short to ensure that the student is able to practice hands-on techniques of physical therapy without risking injury to the skin of your lab partner or patients.

C. Good Personal Habits: Reminders

(1) Wear proper attire and protective clothing, as described.

(2) Wash your hands after entering and before leaving the laboratory.

(3) Never eat, smoke, drink, chew gum, apply cosmetics, or adjust contact lenses while in the laboratory.

- (4) Tie back long hair and trim beards to avoid possible entanglement in equipment or instruments. In addition to personal injury, contamination of specimens, work areas, or reagents may occur from the shedding hair and beards.
- (5) Develop the habit of keeping hands away from the mouth, nose, and eyes.
- (6) Do not put objects in your mouth (like pens or pencils).
- (7) Always wear gloves and change them when contaminated.
- (8) Make frequent hand washing a habit, especially before leaving the laboratory.

D. Good Housekeeping Practices

- (1) Keep work areas free of scattered items, clean, and orderly, such as floors, waste bins, tables and chairs, shelves and cabinets, and equipment. **Refer to the housekeeping daily checklist in the link below:**

<https://docs.google.com/document/d/1VrDTACYwTOh0IukQDA-j8wr3ni4BHbJx/edit?usp=sharing&ouid=105892929441117328514&rtpof=true&sd=true>

- (2) At the end of each lab session:
 - (a) Beds must be remade with clean linen.
 - (b) Any tables, desks, equipment, or chairs moved must be returned to their original location.
 - (c) All equipment and tables must be sanitized and ready to go for the next lab session.
 - (d) If any supplies or equipment run low, please inform your lab instructor.
- (3) Decontaminate equipment and counters upon entering the laboratory and before leaving the work area with a *freshly made 1:10 dilution of household bleach.*

E. Good Laboratory Techniques

(1) Use the provided personal protective equipment (PPE) as instructed.

Laser safety glasses and goggles are designed to reduce hazardous laser eye exposure to safe and permissible levels.

LASER goggles



Gloves protect hands from harmful chemicals, biological agents, and other hazardous materials present in the laboratory. They prevent contamination of samples or experiments by minimizing contact with hands, which can carry oils, dirt, and microorganisms.

Gloves



Masks protect against aerosolized pathogens, reducing the risk of inhalation exposure. This will minimize the risk of respiratory exposure to hazardous materials.

Laboratory Mask



Laboratory coats provide a barrier between the wearer's clothing and any hazardous materials or chemicals that may be present in the laboratory. They help prevent spills, splashes, and accidental contact with harmful substances from reaching the skin and clothing below.

Laboratory coats



- (2) Read all labels and instructions carefully.
- (3) Be familiar with the properties and hazards of equipment for their safe handling and disposal.
- (4) Do not operate new or unfamiliar equipment until proper training and authorization have been given.
- (5) The laboratory instructor must approve all persons entering. Students are not allowed to be in lab rooms without the direct supervision of an instructor, and they will be locked when not in use.
- (6) Learn emergency procedures and become familiar with the location of fire exits, fire extinguishers, and fire alarms.
- (7) A first-aid kit should be available in each laboratory and be easily accessible. A basic first aid kit may include the following items:
 - Plasters come in a variety of different sizes and shapes.
 - Small, medium, and large sterile gauze dressings.
 - Sterile eye dressings.
 - Triangular bandages.
 - Crêpe-rolled bandages.
 - Safety pins.
 - Disposable sterile gloves.
 - Tweezers.

F. Discipline

1. Faculty will continuously monitor students for the practice of safety skills.
2. The faculty will remind students to incorporate safe practices into all laboratory activities.
3. Students who are not compliant with one or more of the safe practices during lab sessions will be advised of the failure and re-instructed by faculty, as necessary.
4. Failure to follow safe practices on a lab practical will result in the student being subjected to disciplinary action as stated in the student handbook.
5. Blatant disregard for the safety of a classmate, the patient, and/or himself or herself will result in disciplinary action determined on an individual basis.

Section II:

FIRE SAFETY

A. Introduction

- (1) Many potential fire hazards exist in the laboratory. However, understanding the basic concepts of fire prevention guidelines and specific procedures for fire protection can ensure a safe working and learning environment.
- (2) Three factors must exist simultaneously for a fire to occur: fuel, oxygen, and an ignition source. The most practical methods for fire control involve restricting contact between flammable substances and an ignition source.

B. Sources of Fire Ignition

- (1) Common ignition sources are open flames, electrical equipment, hot surfaces, spontaneous heating, sparks, static charges, friction, and overheating of flammable liquids.
- (2) Flammable substances and ignition sources must be kept separate to prevent fire.
- (3) Ignition sources that demand special awareness are as follows:
 - (a) Refrigerators
 - Vapors released by low flash point flammable liquids have been ignited when non-explosion-proof refrigerators were used for their storage (the light bulb or switch provided the ignition source).
 - (b) Static Electricity
 - It is recommended that 100% cotton be used in laboratory coats.

- Lab coats made of synthetic fabrics may accumulate static electricity that can discharge with a spark near metallic objects.

(c) Electrical Equipment

- Motor-driven electrical equipment should have a non-sparking induction motor instead of a series-wound motor with carbon brushes.
- Non-sparking motors in vacuum pumps, mechanical shakers, stirring motors, magnetic stirrers, and rotary evaporators ensure that flammable liquids do not ignite.

C. Fire Prevention

Any fire may be prevented by implementing safe laboratory practices as follows:

- (1) Do not use the refrigerators for storage of flammables unless they are properly modified and labeled.
- (2) Avoid storing flammables materials in direct sunlight.
- (3) Ventilate areas where flammables are to be used.
- (4) Avoid filling low-boiling-point liquids to the top of a closed container.
- (5) Use proper disposal methods for flammables.
- (6) Do not use gasoline, alcohol, or other highly flammable, volatile liquids for cleaning.
- (7) Empty containers should be rinsed three times with distilled water and disposed of with caps or stoppers removed.
- (8) Do not use a hot plate, gas, or flame to heat flammable solvents.

- (9) Any spilled liquid should be cleaned up immediately; sand or commercial absorbent will prevent spread and reduce the fire hazard.
- (10) Safety shielding should be worn during procedures with an explosion risk.
- (11) Keep work areas obstruction-free.
- (12) Transfer flammable solvents by pouring through a stainless-steel funnel to which ground leads have been attached.

D. Fire Safety Equipment

- (1) Fire extinguisher types depend on the nature of the fire. The multipurpose (or ABC) extinguisher is often used because it reduces the confusion associated with choosing the type of extinguisher.
- (2) Each student is responsible for knowing the location of all fire extinguishers in the laboratory.
- (3) Operation (the "PASS" procedure):



- (a) **P**ull pin.
- (b) **A**im nozzle on horn at the base of the fire.
- (c) **S**queeze the lever or handle.
- (d) **S**weep the base of the fire.

E. Fire Protocol

(1) Evaluate the fire:

- (a) Is it manageable, not spreading, and not too smoky?
- (b) Is it small enough to manage with appropriate means or a fire extinguisher (trash can size or smaller)?

NOTE: Only consider fighting a small, manageable fire like a wastebasket fire, a non-spreading liquid fire, or an electrical fire where the plug can be safely pulled.

(2) Sound the alarm:

- (a) Pull the nearest alarm box. Each student is responsible for knowing the location of fire alarms available in the laboratory.
- (b) If access to the alarm is blocked, **call 5555** and report the fire. However, the alarm box should **always** be activated first, if possible.
- (c) Remove anyone from immediate danger.
- (d) Close all doors and windows in the vicinity.



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وكالة الجامعة
إدارة الأمن

الرقم الموحد
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(3) Disabled Persons:

- (a) Public Safety makes every effort to track the locations of all persons (students, employees, and visitors) with both obvious and reported disabilities during their time on campus.
- (b) In the event that evacuation is necessary, every effort must be made to facilitate and assist in the evacuation of persons with disabilities.
- (c) Public safety personnel shall immediately direct arriving emergency responders (fire, police, and EMS) to the location of those individuals with disabilities.
- (d) Evacuation chairs are available through the Public Safety Office in the event it becomes necessary to evacuate a non-ambulatory disabled person.

Evacuation procedure

- Calmly inform others.
- Alert others in the area.
- Do not shout "fire" or incite panic.

(4) Evacuate:

- (a) Immediately evacuate the laboratory and the building. The evacuation routes or emergency exits are posted in the laboratory and respective corridors of the building.
- (b) Walk — DO NOT RUN — to the nearest exit.
- (c) Do not use the elevators.
- (d) Assemble outside and wait for directions from the instructor; assist in identifying missing persons, if necessary.

خطّة الاخلاء الآمن | EVACUATION SAFETY PLAN

في حالة وجود حريق		FIRE ACTION IF YOU DISCOVER A FIRE
شغل اقرب جرس حريق		Operate the nearest fire alarm point
اترك المبنى عن طريق اقرب مخرج طوارئ		IMMEDIATELY LEAVE THE BUILDING BY THE NEAREST FIRE EXIT
توجه الى اقرب ساحة خارجية		REPORT TO NEAREST OUTDOOR SQUAIRE
لا تقم بتجميع اغراضك الشخصية		DO NOT STOP TO COLLECT PERSONAL BELONGING
لا تستخدم المصاعد		DO NOT USE LIFTS
لا تدخل المبنى الا بعد أن يصرح لك بذلك		DO NOT RE-ENTER THE BUILDING UNTIL AUTHORISED TO DO SO

F. Signs and Posters

Details of emergency procedures, including the location of emergency exits, fire extinguishers, evacuation points, alarm boxes, and first aid kits.

<https://drive.google.com/file/d/1BNB64CKIZGJsPk8GnESs1Eo5ooTwrAaB/view?usp=sharing>

G. Summary of Fire Safety

(1) Precautions

- Be aware of where the fire evacuation plan is located.
- Know where fire extinguishers and fire alarms are located.
- Maintain marked, unobstructed exits.
- Store flammables in explosion-proof cabinets and safety cans.
- Keep sources of ignition away from flammable materials.
- Only use equipment approved by Underwriter's Laboratories.
- Avoid using extension cords.
- Prohibit smoking in the laboratory.
- Dispose of flammables properly.

(2) Dos and don'ts

- Pull the alarm closest to the fire area.
- Report the fire.
- If the fire is small, try extinguishing it with the appropriate extinguisher.
- If evacuation becomes necessary, use only stairwells for exiting.
- Close all windows and doors before leaving the area.
- STOP, DROP, and ROLL: If clothing catches fire, drop to the floor and roll.

- If trapped in a fire, crawl to the exit; smoke rises, so breathing is easier at floor level; also, breathing through a wet towel helps.
- Do not block exits, and do not re-enter a building.
- Do not panic.
- Do not run.

(3) The acronym "RACE" is another useful method for remembering the proper response to a fire:



R: Rescue — Rescue anyone in immediate danger; alert others to assist.

A: Alarm — If the fire alarms have not sounded, pull the nearest fire pull.

C: Contain — Make sure all doors are closed. Turn off all fans, hoods, or other air-moving systems. Place water-saturated blankets or towels under doors to contain smoke. Turn off all oxygen sources.

E: Extinguish (or evacuate) — Extinguish the fire if your safety can be assured by smothering it with a fire blanket or with a fire extinguisher. Evacuate to the nearest "safe zone."

H. Fire or Emergency Evacuation Drill

A fire drill is a method of practicing how a building should be evacuated in the event of a fire or other emergencies. In most cases, the building's existing fire alarm system is activated, and the building is evacuated by means of the nearest available exits, as if an emergency had occurred.

After the assessment, it's important to analyze the results and address any deficiencies or areas for improvement to enhance the effectiveness of future evacuation drills.

Steps for successful Drills:

- 1: Develop your evacuation plan and checklist.
- 2: Conduct an evacuation drill.
- 3: Assess and track results. Refer to the fire drill assessment checklist in the link below:
<https://drive.google.com/file/d/1qctBSrn1f-GDTTrPtEoTPX-yYZWEhdvUV/view?usp=sharing>

Section III:

ELECTRICAL SAFETY

A. Introduction

Electrical equipment may cause fire, burns, or electrical shocks. Care must be taken to minimize electrical hazards in the laboratory, especially since so much electrical equipment is used.

B. Causes of Electrical Hazards

- (1) Spilled liquids come into contact with instrument circuit boards.
- (2) Broken or damaged instrument components.
- (3) Faulty cords or wires (especially ground wires).
- (4) Improper repairs to electrical equipment.

C. Precautions

- (1) All electrical equipment should be periodically inspected for current leakage, faulty cords, or damaged components.
- (2) Restrict the use of extension cords to only temporary or emergency use. Note that longer cords leak more current. Heavier-gauge cords leak less.
- (3) All electrical equipment should be grounded and have three-pronged approved plugs.
- (4) Immediately repair faulty cords or broken connectors.
- (5) Never overload electrical outlets or circuits.
- (6) Unplug electrical equipment before servicing (even if the service is as minor as replacing the light bulb in a microscope).
- (7) Use electrical equipment according to the manufacturer's directions.

- (8) Use a surge protector on sensitive electronic equipment (and computers) to allow for unexpected spikes in electrical power.
- (9) Signs and labels should be used to warn of the presence of high- voltage equipment or other electrical hazards.
- (10) Report all shocks to the instructor, including minor tingles.
- Small tingles may indicate a potentially greater problem.
 - Shut off the current or unplug the instrument.
 - Do not use an instrument that causes shocks.

D. Electrical Emergency

- (1) Immediately **call 5555** if someone is experiencing electrical shock.
- (2) Use a **Class C fire extinguisher** to control an electrical fire.
- (3) Do not attempt to turn off or unplug malfunctioning instruments or equipment because there is a significant risk of further injury.
- (4) Do not touch an individual who is receiving live current, as the current can pass through the individual.
- (5) If the person is still in contact with the electrical source, only attempt to rescue the shocked individual by using a non-conductive material, such as a wooden chair, to move the individual away from the electrical source. Even this should be done extremely carefully, making sure the rescuer is not wet or standing in water and is not wearing any conductive material such as necklaces, etc.
- (6) If the electrical source is a high-voltage source, no one should approach closer than 20 feet. In all reality, the safest course is to get the experts on the scene as quickly as possible and let them handle it.

Section IV:

CHEMICAL SAFETY

A. Introduction

Certain chemical substances used in the teaching laboratory are potentially hazardous. Despite the infrequency and limited use of hazardous chemicals compared to other laboratory settings, it's crucial to be aware of potential hazards. Physical therapy labs commonly use the following common chemicals:

- 1) **Cleaning agents:** Used for disinfecting equipment and surfaces.
- 2) **Topical medications:** Such as pain relievers and anti-inflammatory creams.
- 3) **Hydrotherapy solutions:** For water-based treatments.

Knowing how to properly move and store chemicals, as well as what to do in case of an accident, will minimize danger from exposure.

B. Hazardous Chemicals

1. Hazardous chemicals are those substances that pose a risk of damage to the lungs, skin, eyes, or mucous membranes following short- or long-term exposure. Per OSHA (OSHA Hazard Communication: Hazard Classification Guidance for Manufacturers, Importers, and Employers, OSHA 3844-02 2016), these include any chemical that is classified as a physical hazard or a health hazard, a simple asphyxia, combustible dust, pyrophoric gas, or hazard not otherwise classified.
2. Hazardous chemicals may be categorized as follows:
 - (a) Organic Solvents: In general, solvents are liquids capable of dissolving or dispersing other substances. In the laboratory, organic

solvents are generally light hydrocarbons used for solubilizing lipids or extracting desired substances from a non-miscible aqueous solution. They are usually volatile and can often penetrate the skin. Ensure you work in a well-ventilated area when handling solvents.

(b) Corrosives (Caustics): The major classes of corrosive chemicals are strong acids ($\text{pH} < 2.1$), highly alkaline bases ($\text{pH} > 12.5$), dehydrating agents, and oxidizing agents. Mixing should always be performed by adding the chemical to water to avoid a possibly violent reaction and subsequent spattering.

If inhaled or ingested, cause severe damage to the gastrointestinal and respiratory tracts. Some substances, like sulfuric acid, penetrate deep into tissues and cause serious burns. Other corrosives may be extremely damaging to the eyes. Immediately irrigating the exposed tissue with water is critical. Continued flushing with water for a minimum of 15 minutes is essential in minimizing tissue damage. If the eyes have been affected, they must be rinsed thoroughly while the eyelids are held open.

(c) Irritants: These substances cause reversible inflammatory effects on living tissue by chemical action at the site of contact.

(d) Carcinogens: Carcinogens are actual or potential cancer-causing agents. Per OSHA (OSHA Hazard Communication: Hazard Classification Guidance for Manufacturers, Importers, and Employers, OSHA 3844-02 2016), carcinogens are substances or mixtures of substances that induce cancer or increase its incidence.

Substances and mixtures that have induced benign and malignant tumors in well-performed experimental studies on animals are considered also to be presumed or suspected human carcinogens unless there is strong evidence that the mechanism of tumor formation is not relevant for humans.

(e) **Toxins (Poisons):** Many chemicals are toxic or poisonous, and cause illness or death, when relatively small amounts are inhaled, swallowed, or absorbed through the skin. Toxic effects may be either local or systemic. Metallic mercury and its compounds are toxic. OSHA standards specify permissible exposure limits (PELs) to OSHA-regulated toxic chemicals. A PEL identifies the level and duration of allowable exposure to a particular toxic chemical. Check warning labels and other available information to determine if a chemical is toxic.

(a) **Ignitable:** Per OSHA, ignitable are solids, liquids, or compressed gasses which are capable of being set afire. These chemicals include both combustible and flammable liquids, as defined by their flash points. The flash point is the lowest temperature at which a liquid emits vapors in such quantities that, when combined with air near the surface of the liquid, forms an ignitable mixture. Flammable liquids have a flash point below 100 °F. OSHA defines combustible liquids as those substances with a flash point at or above 100 °F but below 200 °F. Acetone and

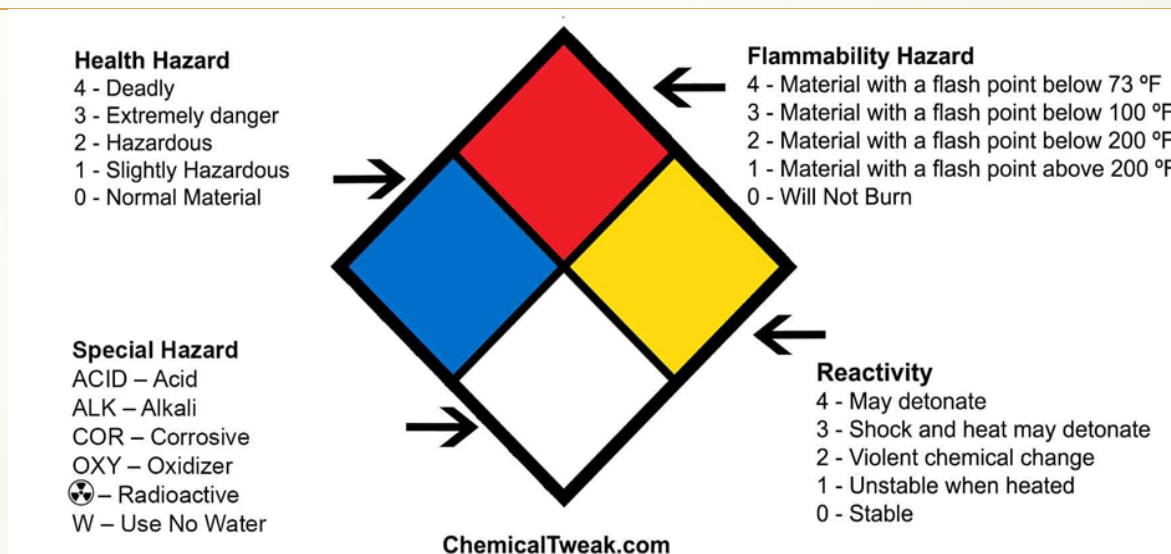
ethanol are flammable liquids, while acetic acid is a combustible liquid. Avoid open flames and sparks and ensure proper ventilation when handling or storing flammables.

(b) Explosives (Reactive): Explosive chemicals are reactive and unstable substances that explode easily and sustain a violent chemical change, often at normal temperatures and pressures. Store and handle explosives according to the SDS.

C. Product Warning Labels Used in Laboratories

(1) NFPA System Labels warning of a hazard should be affixed to a chemical or product. The National Fire Protection Association (NFPA) developed the Hazard Identification System (HIS). The basic HIS symbol consists of four small square diamonds in a larger diamond, each color-coded to indicate a specific hazard. The numerical rating of 0–4 shows the severity of the hazard.

National Fire Protection Rating System (NFPR)



The NFPA hazard sign is most often displayed on commercial product labels. However, when a chemical is transferred from its original container, the new container must be labeled to indicate the identity of the contents and appropriate hazard warnings. The label must include the following information:

- (a) Name of reagent
- (b) Reagent concentration
- (c) Initials of the person who prepared the reagent.
- (d) Date of preparation
- (e) Expiration date
- (f) Special storage requirements

D. Safety Data Sheets (SDS)

(1) Per OSHA, "The Hazard Communication Standard (HCS) (29 CFR 1910.1200(g)), revised in 2012, requires that the chemical manufacturer, distributor, or importer provide Safety Data Sheets (SDSs) (formerly MSDSs or Material Safety Data Sheets) for each hazardous chemical to downstream users to communicate information on these hazards. The information contained in the SDS is largely the same as the MSDS, except now the SDSs are required to be presented in a consistent, user-friendly, 16-section format." (Hazard Communication Standard: Safety Data Sheets. OSHA 3514)

(2) The SDS should include the following information:

- Section 1: Identification
- Section 2: Hazard(s) Identification
- Section 3: Composition/Information on Ingredients
- Section 4: First Aid Measures
- Section 5: Fire-Fighting Measures
- Section 6: Accidental Release Measures
- Section 7: Handling and Storage
- Section 8: Exposure Controls/Personal Protection
- Section 9: Physical and Chemical Properties
- Section 10: Stability and Reactivity
- Section 11: Toxicological Information

E. Handling of Chemicals

- (1) Know how to identify hazardous chemicals and know what special warning labels mean.
- (2) Use the SDS to learn specific hazards of a chemical as well as any special handling requirements and emergency and first aid requirements.
- (3) Wear approved respirators when the air may be contaminated with harmful fumes, mist, gases, or vapors.
- (4) Use a fume hood for any procedure which might result in the release of toxic chemical vapors.
- (5) Use personal protective equipment and clothing; eye protection; safety glasses with side shields; chemical goggles or face shields must be worn when pouring chemicals and cleaning up spills (or whenever there is a possibility of splashing).

F. Storage and Disposal of Chemicals

The storage of hazardous chemicals is partly controlled by standards set by governmental agencies as well as other factors, such as the environmental controls of the building. Efforts have been made to maintain the storage of hazardous chemicals used in the Teaching Laboratory in the most acceptable manner. The following are general guidelines for the storage of chemical hazards regardless of the setting:

- (1) Every chemical should have a specific storage place and should be returned to the location after use.

- (2) If possible, store chemicals on shelves with lips or raised edges to reduce the possibility of a container falling off and to minimize leaks or spills should they occur. Try to avoid storage on bench tops and in hoods.
- (3) Replace chemicals that are no longer used, that show signs of deterioration, or whose container is old, leaking, or corroded.
- (4) Separate chemicals that are potentially incompatible and that might react with one another to produce an explosive, toxic, or flammable product. For example, store acids in an acid cabinet and store flammable chemicals in a flame cabinet.
- (5) Store flammables away from any possible source of ignition.
- (6) Substances must never be discarded into the sewer system. Consult the instructor and the SDS for the proper disposal methods.

Section V:

EQUIPMENT SAFETY

Physical therapy laboratories utilize a variety of equipment and instruments. Injury to a person and damage to property may result from improper use, storage, and maintenance of equipment.

Here are some guidelines for safely using physical therapy equipment:

(1) Proper Training

Ensure that all personnel using the equipment have received adequate training on its operation, including safety protocols and emergency procedures. Do not operate new or unfamiliar equipment or instruments without proper training and authorization.

(2) Equipment Inspection

Before each use, inspect the equipment for any signs of damage or malfunction. Pay special attention to moving parts, electrical connections, and stability. Keep covered and free from dust and dirt. Properly shut down the instruments after use.

(3) Patient Assessment

Before starting any treatment session, perform a thorough assessment of the patient to identify any contraindications or risk factors that may affect the safe use of the equipment.

(4) Patient Instruction

Provide clear and concise instructions to the patient on how to use the equipment safely. Ensure that they understand how to adjust settings, position themselves correctly, and communicate any discomfort or concerns during the session.

(5) Proper Positioning

Always ensure that the patient is properly positioned on the equipment according to the manufacturer's guidelines and the therapist's recommendations. Incorrect positioning can lead to strain or injury.

(6) Supervision

Patients should always be supervised while using physical therapy equipment, especially if they are performing exercises or movements that require assistance or guidance.

(7) Weight Limits

Adhere to weight limits specified by the manufacturer for each piece of equipment. Overloading the equipment can lead to structural failure and injury.

(8) Emergency Stop

Familiarize yourself with the emergency stop mechanism on each piece of equipment and know how to use it in case of an emergency or malfunction.

(9) Hygiene

Maintain strict hygiene protocols, including cleaning and disinfecting equipment between patients to prevent the spread of infections.

(10) Documentation

Keep detailed records of equipment maintenance, inspections, and any incidents or accidents that occur during use. This information can help identify potential safety issues and improve protocols in the future.

(11) Regular Maintenance

Schedule regular maintenance checks for all equipment to ensure that it remains in good working condition. Follow the manufacturer's recommendations for maintenance and servicing.

(12) Reporting

Encourage staff to report any equipment defects, malfunctions, or safety concerns to the appropriate personnel immediately. Prompt reporting can help prevent accidents and injuries.

Section VI:

LABORATORY WASTE PROCEDURE

A. Introduction

It is essential to properly identify, segregate, handle, and dispose of physical therapy waste according to regulations and guidelines to minimize the risk of exposure to potentially harmful substances and prevent environmental pollution. Facilities must adhere to regulation and guidelines, implementing specific protocols for safe management of physical therapy waste to protect both staff and patients.

B. Identification of laboratory wastes

Physical therapy waste can include various types of waste generated during physical therapy sessions and treatments. Here are some common examples:

1. Biohazardous Waste

- a. Used needles, syringes, and lancets.
- b. Blood-soaked bandages or gauze.
- c. Wound dressings containing bodily fluids.

2. Chemical Waste

- a. Disinfectants and cleaning solutions.
- b. Chemical ice packs.
- c. Expired or unused medications.

3. General Medical Waste

- a. Used gloves and other personal protective equipment.
- b. Patient linens or towels contaminated with bodily fluids.
- c. Disposable medical supplies such as electrodes, adhesive tapes, and braces.

4. Electrical Waste

- a. Broken or obsolete electrical equipment (e.g., TENS units , ultrasound machines.
- b. Batteries used in therapy devices.

5. Packaging Waste

- a. Cardboard boxes, plastic wraps, and other medical supply packaging materials.
- b. Empty medication vials or containers.

6. Sharps Waste

- a. Used acupuncture /dry needles.
- b. Scalpels and other sharp instruments used in therapy procedures.

C. Laboratory waste management and disposal

Effective waste disposal procedures can help visualize the process and ensure that all steps are followed correctly. A flowchart for laboratory waste disposal procedures can aid in visualizing and ensuring adherence to correct the procedure. Each step should be followed carefully to ensure the safe and proper handling of laboratory waste. Refer to the flowchart poster on waste management in link below:

<https://drive.google.com/file/d/183zzjcbapk04TJVZQr9pkWy7sJ1yMZh-/view?usp=sharing>

Here's a basic flowchart outlining the typical steps involved in laboratory waste disposal:

1. Identify Waste: Determine the type of waste generated in the laboratory (chemical, biological, general).

2. Segregate Waste: Separate waste into different categories based on its type and hazard level.
3. Labeling: Label waste containers with appropriate symbols and hazard warnings.
4. Storage: Store waste in designated areas using compatible containers.
5. Chemical Waste Handling
 - a. Follow MSDS/SDS for proper handling and disposal of chemical waste.
 - b. Neutralize or detoxify chemicals, if necessary, before disposal.
 - c. Use compatible containers for storage and transport.
6. Biological Waste Handling
 - a. Autoclave or sterilize biological waste to deactivate pathogens.
 - b. Use leak-proof and puncture-resistant containers.
 - c. Follow biosafety guidelines for handling and disposal.
7. General Waste Disposal
 - a. Dispose of non-hazardous waste in designated general waste bins.
 - b. Recycle materials such as paper, plastic, and glass whenever possible.
8. Personal Protective Equipment (PPE)
 - a. Wear appropriate PPE.
 - b. Dispose of contaminated PPE according to procedures.

9. Documentation

- a. Maintain records of waste generation, segregation, and disposal activities.
- b. Complete waste disposal manifests/forms.

10. Training and Awareness

- a. Provide training to personnel on waste handling procedures.
- b. Raise awareness on the importance of proper waste management.

11. Emergency Response

- a. Have procedures on display for handling spills or accidents. Displaying this poster prominently in laboratory areas can help ensure that all personnel are familiar with the proper procedures for responding to spills and can contribute to a safer work environment. Refer to the Spills Response poster and Spill Kit in the link below:

<https://drive.google.com/file/d/1fL4uIgRYrZW1UuCPB-ZExclghZHihkp9/view?usp=sharing>
- b. Provide spill kits and cleanup materials.

Section VII:

EMERGENCY INJURY PROCEDURE

A. Emergency Injury Protocol

In the event of an accident incurred in the laboratory resulting to injury or medical emergency the following protocol will be applied. Refer to the Emergency Contact Sign in the link below:

<https://drive.google.com/file/d/1dLWMPJ84DsPqN-LvmQYkkFzXW-ZbmzDp/view?usp=sharing>

1. Student or laboratory personnel responsibilities

- a. Immediately **call 5555** and report the incident to your instructor.
- b. Apply first aid.
 - Wounds should be immediately cleaned vigorously and thoroughly with soap and water.
 - Mucus membranes should be flushed with water or normal saline solution immediately.
 - Any other treatment will be given as indicated.
- c. Assist and facilitate the transfer of the injured patient to the University clinic.

2. Investigator or instructor responsibilities

- a. **Call or follow-up 5555** if necessary or unattended.
- b. Instruct the injured patient to proceed to the university clinic if ambulant.
- c. Consult the laboratory supervisor or safety officer.
- d. Complete the incident report form and submit it to the department head for recording.

- e. Per review, specific recommendations will be made depending on the type of exposure and infectious agents that are involved.

B. Incident report

This refers to the detailed written report of the incident that transpired involving the personnel and/or student during the laboratory activity. Refer to the incident report form in link below:

<https://drive.google.com/file/d/16Z37c--2rMiS592JMEFEfkwvNA61nhv/view?usp=sharing>

The form consists of the following elements:

- (1) Incident Description. Describe the circumstances of the incident.
- (2) Injury/Illness/Damage to Equipment, Building, Environment. Describe the extent of injuries and/or damage.
- (3) Actions Taken: Response/Treatment/Cleanup. Describe the nature of the emergency action taken.
- (4) Corrective Action Taken.

Section VIII:

SAFETY SIGNAGES

A physical therapy lab may have specific safety signs tailored to the activities and equipment used in that environment.

These signs help promote a safe environment for both patients and staff in the physical therapy lab, reducing the risk of accidents, injuries, and the spread of infections. They should be prominently displayed and regularly maintained to ensure visibility and effectiveness.

Here are some examples of safety signs you might find in a physical therapy lab:

(1) Caution: Wet Floor

To alert individuals to a wet or slippery floor, which is common in areas where therapy sessions involve water or spillage.

https://drive.google.com/file/d/1ZSxsKCNCu7SJgHL6WRc7TwZRbFqjrFWb/view?usp=drive_link

(2) Equipment Safety

Signs posted near exercise machines and therapy equipment indicating safe operation procedures and any associated hazards.

<https://drive.google.com/file/d/1TNHT9d0rkB1XeDGYIRpbo4Z5075xybMn/view?usp=sharing>

(3) Proper Lifting Techniques

Reminding the proper lifting techniques to prevent back injuries when moving heavy objects or patients.

Objects:

<https://drive.google.com/file/d/1pbuCxPxtXslMkoMjtI4Wk5XUhFsbruWK/view?usp=s>

[haring](#)

Patient:

<https://drive.google.com/file/d/1->

[o29sini8sf2x7Sh0kQV3sIIH89zeM6P/view?usp=sharing](https://drive.google.com/file/d/1-)

(4) Emergency Procedures

Signs detailing emergency procedures, including the location of emergency exits, fire extinguishers, evacuation points, alarm boxes, and first aid kits.

<https://drive.google.com/file/d/1BNB64CKIZGJsPk8GnESs1Eo5ooTwrAaB/view?usp=sharing>

(5) Personal Protective Equipment (PPE)

Signs reminding individuals to wear appropriate PPE, such as gloves or safety goggles, when handling equipment or working with patients.

https://drive.google.com/file/d/1hI4AByaVlkBvX0lw0m1gHVE5gedVe_VF/view?usp=s

[haring](#)

(6) No Food or Drink

Prohibiting food or drink consumption in the lab area to maintain cleanliness and prevent contamination.

[https://drive.google.com/file/d/1qSyKGoeTknxR8rISgoYnpZuX534eSWO4/view?usp=](https://drive.google.com/file/d/1qSyKGoeTknxR8rISgoYnpZuX534eSWO4/view?usp=sharing)

[sharing](#)

(7) Restricted Access

Signs indicating restricted areas.

<https://drive.google.com/file/d/1NSAbqolht9XI0L64XjUG->

[uu4k3zSS99B/view?usp=sharing](https://drive.google.com/file/d/1NSAbqolht9XI0L64XjUG-)

or equipment that requires special authorization or training to use.

https://drive.google.com/file/d/1_MRtIoLYtID-ByGEdRyCyJQ3W1b8-K-E/view?usp=sharing

(8) Stretching and Warm-up Area

Designating specific areas for stretching and warm-up exercises, with instructions for safe and effective techniques.

https://drive.google.com/file/d/1vPVre_IIfH6kwLxrJErTaQCd-9muxziC/view?usp=sharing

(9) Infection Control

Signs emphasizing the importance of infection control measures, such as hand hygiene

https://drive.google.com/file/d/10XMkfPh9L_jEKAk01sT6-vKb5xftt6yZ/view?usp=sharing

and equipment disinfection, to prevent the spread of illnesses.

https://drive.google.com/file/d/1JVjkYi3i0sphCLvPRvChVhRuoD_0Z70_/view?usp=sharing

▪ Here are all the safety signs you might find in a physical therapy lab:

<https://drive.google.com/file/d/1LYHxSt05O2dPbOEgFXm4z61qoCzoooGN/view?usp=sharing>

The End