



**ENVIRONMENTAL HEALTH
AND SAFETY**

LABORATORY SAFETY AUDIT GUIDE

Updated: September 2021

Mission Statement

The mission of UNMC Environmental Health and Safety is to foster a culture of absolute safety for our students, faculty, staff, patients and visitors and to minimize environmental and regulatory risks to UNMC and Nebraska Medicine.

We will realize this mission by adhering to our Values.

Values

Integrity: Our department will be comprised of individuals committed to our mission and values. We will be accessible, professional, and courteous. We will have no fear in our pursuit of excellence and aim to be a trusted resource to the UNMC and Nebraska Medicine community.

Commitment: We are committed to provide expert guidance and timely service to make sure that UNMC and Nebraska Medicine are in compliance with the regulatory requirements for which we are responsible.

Collaboration: We will grow as one Department, collaborating and working together to find innovative solutions to any problem. We will emphasize open communication and focus on partnering rather than policing to develop understanding and accountability for all.

Excellence: We strive to go beyond compliance to be a preeminent EHS department and will work to achieve exceptional results. We will diligently assess safety risks and develop policies, procedures, and innovative training and audit programs to keep these risks to the absolute minimum.

Empowerment: We will do our part to create an atmosphere that is culturally sensitive, diverse and inclusive which eliminates negative conditions impacting personal well-being. We will do this by developing policies and procedures in partnership with our customers, tailored to our unique needs. This will empower faculty, staff and students to understand regulatory compliance while maintaining academic freedom.

Introduction

All laboratories are audited on an annual basis by the UNMC Environmental Health and Safety Office to ensure compliance with federal, state and university requirements. Inspections may also be periodically unannounced as they relate to a reported incident or when potential unsafe laboratory practices are reported.

If you have any questions regarding lab audits, or need to report any unsafe lab practices please contact the EHS Office at (402) 559-6356.

As we all play an important role in research on campus, it is required that each lab be inspected according to policy. Based on the research being conducted in your lab, you are subject to various lab audits/inspections at any time.

The purpose of annual lab audits is to ensure all labs are following the appropriate lab safety policies and procedures within their research labs. Lab safety audits are conducted on an annual basis and scheduled through the Environmental, Health and Safety Office. Each lab will be contacted to schedule their annual audit.

This audit covers the general practices of lab safety to meet OSHA requirements, as well as the chemical safety audit of each lab to meet EPA requirements. The EPA RCRA Compliance Audit program has evolved from the efforts of the Associate General Counsel and Director of Institutional Compliance for the University of Nebraska. The primary objective of the EPA RCRA Compliance Audit is to provide EPA regulatory guidance to UNMC personnel, and has been designed to accomplish the following goals:

1. Ensure that all labs/chemical use areas are in compliance with EPA RCRA and OSHA regulations.
2. Visit labs handling materials in order to gather information on the generation of hazardous waste and subsequent disposal.
3. To promote waste minimization and pollution prevention.
4. Help UNMC personnel become familiar with EPA and OSHA regulatory compliance inspection interviews.

The laboratory audit process at UNMC should be viewed as a positive management tool which provides the user and UNMC with an opportunity to assess environmental impacts and correct any potential problems prior to a regulatory inspection.

Laboratory Safety Audit Categories Standards and Explanations

This information is a supplement of standards and explanations to the audit items organized by category on the laboratory safety audit checklist. The explanations provided are supported by government and/or state regulations or are considered to be best practices by accredited and respected sources.

The primary purpose for annual laboratory safety audits is to ensure all laboratory principal investigators, staff, and students are conducting research safely and in accordance with the EPA and OSHA regulations applicable to the research laboratories.

Please reference the UNMC Laboratory Safety Manual for additional information or contact the Environmental Health & Safety (EHS) Office at 559-6356 or via email at unmcehs@unmc.edu.

Laboratory Safety Training

1. Are all lab personnel, students, and working visitors trained on experiments and/or procedures that are being performed in the laboratory?

While working in a research laboratory you will likely use instruments, materials and reagents that have the potential to harm you, your co-workers and the environment. Consequently, it is important to spend time at the beginning of your project to learn the safety standards of your discipline and workplace to ensure everyone's good health and safety. Effective training is critical to creating a safe environment and for the prevention of laboratory incidents. You are **required to document** all training that is provided to personnel, students, and visitors working in the laboratory. [Laboratory Safety Training Record](#) is available for laboratories to use and document lab-specific training requirements.

Based upon the nature of the research work you will be doing, you may also be required to complete additional training. Additional training is required for individuals that work with radioactivity, biohazard agents, research animals, and shipping dangerous goods.

Reference: Section 5(a)(1) of the Occupational Safety and Health Act of 1970 (OSH Act), the General Duty Clause

Chemical Safety

1. Have all individuals working in the lab been educated about the chemical hazards present within the lab space(s)?

This includes hazards associated with equipment, stored energy, pressure vessels, hazardous chemical reactions, shock sensitive substances, flammable/explosives, etc. All lab personnel must be aware of the hazards present and take the necessary steps to minimize or eliminate them. All employees/students in laboratories must know what personal protective and safety equipment is available, when it is required, how to use it, when it is not safe to use and how to dispose of it. All laboratory safety training **must be documented**.

Reference: The Occupational Exposure to Hazardous Chemicals in Laboratories standard ([29 CFR 1910.1450](#))

2. Has a risk hazard assessment been conducted for all chemicals, substances and processes that pose a physical risk and/or health hazard?

This may include chemicals that are flammable, air or water reactive, explosive, corrosive, toxic, etc. Risk hazard assessments should take into consideration ways to minimize or eliminate exposures to the physical and health hazards through the use of engineering controls, barriers, substitution and/or personal protective equipment. This is also important so lab personnel know which chemical spills they can safely clean and which they need to call for assistance. Risk assessments **must be documented** and kept on file within the laboratory. During safety audits, EHS staff may ask to see the documentation of risk assessment records.

*References: [Laboratory Standard List for Particularly Hazardous Substances \(PHS\)](#)
[PHS Assessment Form](#)*

3. Are Safety Data Sheets (SDS) readily accessible to lab personnel for ALL chemicals/substances present in the lab space(s)?

Individuals must review SDS (formerly known as MSDS) information prior to working with any chemicals or substances. Appropriate PPE must be used as listed on the SDS. Ref:

References: [UNMC MSDS Online](#) and [OSHA 29 CFR 1910.1200\(g\)](#)

4. Are chemicals, including chemical waste, properly labeled and stored by hazardous class and compatibility?

Please reference the Hazardous Materials Fact Sheet, [Chemical Storage](#), for information on storing of chemicals. Flasks and/or media collection containers must be clearly labeled to indicate their contents so those responding to spills will know what has spilled. Chemical collection containers must all be labeled with the word "waste" and the full chemical name(s). *Do not* use abbreviations of chemical names. Please reference [Chemical Labeling](#) for additional information, and label templates that area available for you to use.

Once a collection container is full or has not been added to recently, the container must be tagged with a green chemical collection tag for EHS to pick up and properly dispose of the chemical waste. Please reference the Hazardous Materials Fact Sheet, [Chemical Disposal](#), for additional information.

*Reference: EPA 40 CFR, 265.170-177, Subpart I—Use and Management of Containers
UNMC Chemical Labeling*

5. Are flammable chemicals, including chemical waste, being stored in an approved storage room or flammable liquids cabinet?

Proper chemical storage is a requirement for any lab using hazardous materials. Chemicals shall be organized by compatibility, clearly labeled with full chemical name (no abbreviations) and in good condition. (For example, it is dangerous to store acids with bases and/or flammables with corrosives). Solids are stored above and liquids below. Oxidizers are not stored with organics. Flammable liquids are stored in a UL/FM approved flammable liquids cabinet, with a door that is latched shut. A one day "working" supply of flammables is all that is allowed to be kept outside of an approved storage room (ASR) or flammable liquids cabinet (FLC). Chemical waste containers must also be stored at or near the point of generation. Chemicals shall not be stored in a fume hood or biosafety cabinet.

Reference: NFPA 30, Flammable and Combustible Liquids Code

6. Are all chemical waste containers closed, labeled appropriately, and stored in secondary containment?

Please reference the Hazardous Materials Fact Sheet, [Chemical Storage](#), for information on storing of chemicals. Please reference the Hazardous Materials Fact Sheet, [Chemical Waste Collection Container Storage](#), for information on storing of chemical waste containers.

Reference: EPA 40 CFR, 265.175

7. Is the lab properly disposing of chemical waste and all other EPA regulated items?

Chemical waste must be properly disposed. Please reference the Hazardous Materials Fact Sheet, [Chemical Disposal](#), for additional information on how to submit this item for pick-up and disposal by EHS. For questions related to EPA regulated items, please contact EHS at (402) 559-6356.

Other EPA regulated items (i.e. aerosol cans, batteries, lead autoclave tape, and hand sanitizer) must also be tagged with the green chemical collection tag and picked up by EHS staff.

Certain chemicals can be safely disposed to the sanitary sewer. Please reference Hazardous Materials Fact Sheet, [Sanitary Sewer Disposal](#), for additional information. This document will provide you with guidance on what can and cannot be disposed of through the sanitary sewer (sink).

8. Is the lab properly disposing of empty chemical containers, including p-listed chemicals?

Before disposing of empty chemical containers, labs must ensure it is not an item that is EPA regulated. Please reference the Hazardous Materials Fact Sheet, [Empty Chemical Container Disposal](#), for additional information.

9. Does the lab have mercury thermometers?

Mercury affects the central nervous system and with prolonged exposure, can cause brain damage. It is recommended that all labs replace mercury thermometers with alcohol thermometers. Elemental mercury spills account for approximately 80% of the spills in which EHS staff respond to on campus. Elemental mercury is somewhat volatile and is readily absorbed via the respiratory tract and through the skin. It is recommended that all labs replace mercury thermometers with alcohol thermometers. Mercury but be disposed of through EHS.

10. Has the lab submitted an updated chemical inventory to EHS within the last year?

Information on submitting chemical inventories can be found online at: <https://www.unmc.edu/ehs/chemical-safety/chemical-inventories.html>

11. Does the lab ship hazardous materials or dangerous goods? (i.e. biological agents, patient/animal specimens, dry ice, chemicals)?

All employees who ship hazardous materials or dangerous goods, which includes dry ice, Category A Infectious Substances affecting humans and/or animals, Category B Infectious Substances (biological substances), patient specimens (except human or animal specimens) and cultures, shall follow regulatory requirements for the applicable mode of transportation (e.g., air, ground).

The shipment of hazardous materials or dangerous goods is a serious matter that requires UNMC compliance with regulatory requirements. Employees shall meet the initial and recurrent training requirements prior to

signing a shipper's declaration or authorizing a hazardous material or dangerous goods package not requiring a shipper's declaration.

Reference: [Hazardous Material/Dangerous Goods Shipping Plan; DOT Title 49 CFR](#)

12. Does the lab ship items out of the country?

This includes testing kits, chemicals, radioactive material, equipment, hardware and materials including biological materials, technical information or data and/or software/code.

Reference: [Export Control](#)

Emergency Procedures

1. Are laboratory personnel aware that they are to report all needle sticks and cuts via the OUCH Pager: 402-888-6824?

If laboratory personnel sustain a needle stick or cut, they must call the Employee Health 24/7 OUCH Pager at (402) 888-OUCH (6824). You will need to have your Principal Investigator's contact information and it is extremely important to know what you have been exposed to prior to contacting the OUCH pager. This allows the individual receiving the call to provide proper guidance on how to treat the medical emergency. Exposures with non-serious injuries, call the OUCH pager at (402) 888-OUCH (6824) for post exposure medical guidance on exposures that occur on campus including needle sticks, biological, animal, etc.

For all radioactive material and chemical exposures, please contact Campus Security at (402) 559-5555. In the event that you have an exposure with serious injuries, contact Campus Security at (402) 559-5555 or go to the Emergency Department on campus.

2. Are laboratory personnel aware of the Emergency Preparedness Guide, which includes the chemical spill procedures?

The Emergency preparedness guides are posted in all UNMC buildings near elevator lobbies and stair tower/exits. The guide is also available online: [UNMC Emergency Preparedness Guide](#). These guides provide information on what to do in the event of an emergency.

Report all spills to UNMC Campus Security at (402) 559-5555. Chemical spills can and do occur despite our best intentions. Depending on the chemical properties and quantity of the spilled chemical it can create potentially dangerous situations. Therefore, it is important that UNMC personnel are prepared for chemical spills.

Reference: 42 CFR 483.73 Emergency Preparedness

3. Does the laboratory have a current (2020) laboratory safety poster present and have all laboratory personnel reviewed the information?

This poster is to comply with the fire marshal's requirement that each lab has a laboratory safety poster, in languages understood by lab staff. The laboratory's department is responsible for working with EHS on getting the poster translated, if necessary.

If you need assistance with your laboratory safety poster or to request a laboratory safety poster, please contact Kelly Johnson at (402) 559-9913, ka.johnson@unmc.edu. You may also download and print a poster on 11"x17" paper: [UNMC Laboratory Safety Poster](#).

Listed below are some of the items included on the Laboratory Safety Poster. All laboratory personnel must review this information and know the location for all items listed on this poster.

Laboratory Emergency Equipment:

- **Safety Showers**

The OSHA requirements for emergency eyewashes and showers, specify that "where the eyes or body of any person may be exposed to injurious corrosive materials, as well as additional substances and compounds that have the capability of producing adverse effects on the health and safety of humans suitable facilities for quick drenching or flushing of the eyes and body shall be provided within

the work area for immediate emergency use. Workers in laboratories and other places where biological or chemical agents are used must have fast access to emergency flushing areas. These areas are necessary for the immediate first aid of chemical splashes or other incidents. In the event of contact with a chemical or substance, emergency showers should be used for the immediate removal of chemical splashes and spills.

Laboratory personnel must know the location of the nearest safety shower. Safety Showers must be kept free from obstructions, at ALL times.

Reference: OSHA 29CFR 1910.151(c), ANSI [Z] 358.1-2004)

- **Eyewash Stations**

An emergency eyewash station provides a means to remove chemical contamination from the eyes and/or face. Eyewash stations within laboratory rooms must be tested and recorded **weekly** by laboratory personnel to ensure water flow and quality. [Eyewash/Drench Hose Weekly Inspection Log Form](#) This helps clean out any rust, scale deposits, or bacteria that may accumulate. Laboratory personnel must know the location of the nearest eyewash station. Eyewash stations must be kept free from obstructions, at ALL times.

References:

[Laboratory Safety Manual, Section 4 \(Laboratory Emergency Equipment\)](#)
OSHA 29CFR 1910.151(c), ANSI [Z]358.1-2004

- **Personal Protective Equipment(PPE)**

Personal protective equipment is protective gear needed to keep workers safe while performing their jobs. It is a general term used to describe anything you can wear and/or use in order to protect yourself when working with chemical or biological hazards.

It is important that PPE is selected based upon the hazard(s) to the worker, properly fitted and in some cases periodically refitted (e.g. respirators), conscientiously and properly worn, regularly maintained and replaced in accordance with manufacturer's specifications, properly removed and disposed of to avoid contamination of self, others or the environment.

References: [Laboratory Safety Manual, Section 5 \(PPE\)](#)

- **Fire alarm pull station, fire extinguisher and exit stair tower**

Be aware of your surroundings at all times, and know the location of the nearest fire extinguisher, fire alarm pull station and the nearest exit stair tower. Knowing the location of each, can expedite response and minimize the risk of injury and/or death. If you need assistance locating the fire alarm pull station nearest to your area, please contact EHS at (402) 559-6356.

- **Muster point**

A muster point is the place everyone must go in an emergency to make sure no one is missing. Those not accounted for must be reported to the Security Officer in charge. Lab personnel should work together to determine a muster point location.

- **Severe Weather Safe Area**

Building evacuation plans are posted by stair tower exits and/or elevator lobbies in most buildings. The building evacuation plan will highlight the designated safe area for the building. Severe weather can happen anytime, in any place. Severe weather includes hazardous conditions produced by thunderstorms, including damaging winds, tornadoes, large hail, flooding and flash flooding, and winter storms associated with freezing rain, sleet, snow and strong winds.

4. Does the lab have a chemical spill kit?

Every laboratory must have a chemical spill kit present and stored near where chemicals are used. For information on purchasing a chemical spill kit, please reference the Hazardous Material Fact Sheet, [Chemical Spill Kits](#). All laboratory personnel must know the location of the chemical spill kit within their laboratory.

References: EPA 40 CFR 112.7, OSHA 29 CFR 1910.120, OSHA 29 CFR 1910.22

5. Does laboratory personnel know how to report fires, chemical spills, exposures, and other accidents/incidents or nearmisses?

Reporting fires must be done by pulling the fire alarm and dialing the Campus Emergency Number (402) 559-5555. ALL fires must be reported (including those you have put out). The fire alarm alerts everyone in the building that something is occurring. Everyone must follow the directions given over the fire alarm house paging system and/or in person by Campus Security, Omaha Fire Department, or Omaha Police Department.

All accidents/incidents or near misses must be reported by completing the [Incident Report form](#). This will provide complete and accurate documentation of the details related to an incident, ensure follow-up and allow training to be developed to prevent future occurrences. Please reference the [UNMC Emergency Preparedness Guide](#).

6. Are staff aware that they MUST evacuate the building if directed to do so and not re-enter until the "all clear" has been issued?

An order to evacuate may be given during a fire, hazardous material spill/release or any other situation which may endanger the building occupants. Smoke and hot gases are toxic and lethal. The order to evacuate may come in the form of a message played over the fire alarm system, an order from Security/police/fireman or the Incident Commander. It may be communicated over the fire alarm system, public address/paging system, emergency notification systems, or in person. No one is to re-enter the building/area until the fire department has declared it to be safe and the "ALL CLEAR" has been given. Failure to follow directions to evacuate may result in disciplinary action or your arrest. Please reference the [UNMC Emergency Preparedness Guide](#).

General Safety

1. Are food and drink present in the lab?

The use of food and drink and/or the application of cosmetics, lip balm or contact lens are not allowed in any areas including laboratories where chemical, biological or radioactive materials are used or stored. This prevents the accidental ingestion of harmful items if food were to become contaminated. Make sure to wash hands before eating, drinking or applying cosmetics.

References: [No Food or Drink Poster](#); [UNMC Food, Drinks, and Cosmetic Use in Laboratory Areas Policy #2010](#)

2. Do all aisles within the laboratory space(s) have sufficient width of 36" for passing?

The requirement for research laboratories on campus is a 36-inch clearance for aisle spaces. The fire marshal will measure "clear and unobstructed" width by opening the doors and drawers to cabinets and taking the measurement. The spaces between benches, cabinets and equipment must also be accessible for cleaning. Keep aisles and passageways clear and in good repair, with no obstruction across or in aisles that could create a hazard.

Reference. *OSHA Standard Walking-Working Surfaces, 29 CFR 1910.22, NFPA 101-2015 36.2.5.5*

3. Are any doors or corridors obstructed?

No items shall be placed which block doors. No items shall be stored in corridors. Doors must be able to be opened at all times. Doors must also be able to close at all times, to prevent the spread of smoke, fire and fumes. Corridors must be kept clear to provide quick and safe access to exits in emergencies. Keep exits free from obstruction. Access to exits must remain clear of obstructions at all times. Exit routes must be free and unobstructed. No materials or equipment may be placed, either permanently or temporarily, within the exit route.

Reference: *OSHA 29 CFR 1910.37*

4. Are there any items placed on the corridor doors or vision panels (windows) on the doors?

These doors are fire doors and nothing is to be placed on fire doors or vision panels in fire doors, as it may impede egress, and not allow inspection of the lab from the corridor.

5. Are any doors being held and/or propped open with a door stop or other object?

Blocking or wedging doors open will allow the spread of smoke, fire and fumes to enter the corridor making it difficult to evacuate in the event of a fire emergency.

6. Is the appropriate dress code attire being worn within the lab?

All laboratory personnel shall be dressed in a manner that does not impair safety. Open toed shoes are NOT allowed in the laboratory. Dressing appropriately prevents injury from hazardous substance spills and sharps. Long hair must be tied back. Avoid wearing loose clothing and dangling jewelry, as they can become entangled with equipment.

7. Is Personal Protective Equipment (PPE) readily available (lab coats, gowns, gloves, face protection, etc.) for all lab personnel and are lab personnel trained to use the appropriate PPE?

Personal protective equipment, commonly referred to as "PPE", is equipment worn to minimize exposure to hazards that cause serious workplace injuries and illnesses. These injuries and illnesses may result from contact with chemical, radiological, physical, electrical, mechanical, or other workplace hazards. Personal protective equipment may include items such as knee length lab coats (buttoned to protect your clothing), gloves, safety glasses and shoes, earplugs or muffs, hard hats, respirators, or coveralls, vests and full body suits. Please reference the [Laboratory PPE Selection Guide](#) for additional information on types of PPE.

The laboratory PI must provide appropriate PPE for each employee/student working in the laboratory and record the issuance of PPE for each individual. All lab personnel shall know what PPE is available, when it is required, how to use it, when it is not safe to use and how to dispose of items. PPE must be readily available and used when necessary. It must also be checked before each use to see that it is in good condition. All PPE clothing and equipment must be of safe design and construction and must be maintained in a clean and reliable fashion. [PPE Issuance and Training Record Form](#)

References: [OSHA PPE Fact Sheet](#); OSHA Standard Personal Protective Equipment, 29 CFR 1910.132(a),

8. Is appropriate eye protection readily available for the hazards (UV, lasers, chemicals, etc.) within the laboratory and are all lab personnel trained to use the proper eye protection?

It is important to always use safety eyewear that meets American National Standards Institute (ANSI) standard Z87.1. Safety eyewear that meets Z87 is tested and must pass stringent requirements for impact, distortion, light transmittance, and lens thickness, among others. The type of eye protection must match the hazard, and there are definitely types more appropriate for certain hazards. Special hazards such as UVL, welding, or lasers require special safety eyewear.

References: [International Safety Equipment Association Eye & Face Protection](#), ANSI Z87.1, ANSI Z136.1-2014, OSHA 1910.132

9. Is respiratory protection used in the lab?

ALL respirator users must have a medical evaluation and be fit tested on an annual basis. This includes all NIOSH approved and disposable N-95 respirators. Respirator and/or Powered Air Purifying Respirator (PAPR) users must be trained in the proper care and use of the respirator/PAPR.

The laboratory PI must provide respirators that are appropriate based on the hazards to which their employees/students are exposed and factors that affect respirator performance and reliability. The laboratory PI must keep an up to date record of all employee/student respirator fit testing certifications. Contact EHS for assistance in selecting the appropriate respirator, or PAPR, for the task and/or if you have any questions about fit-testing and training.

*Standard surgical/dust masks do not require fit-testing. If the surgical/dust mask reads NIOSH or N-95, that is considered a respirator and you must be fit-tested accordingly.

References: [CDC: Respirator Trusted-Source Information](#); [OSHA Respirator Protection eTool](#); [OSHA 3079: Respiratory Protection](#); OSHA 29 CFR 1910.134

10. Are appropriate gloves being used and then removed prior to leaving the lab?

Gloves must be compatible with the material being handled. When handling chemical, physical and/or biological hazards that can enter the body through the skin, it is important to wear the proper protective gloves. In essence, certain gloves provide better protection than others. [Microflex Chemical Resistance Glove Guide](#)
The use of powdered latex gloves is prohibited on campus. [UNMC Latex Sensitivity Policy 2003](#)

Gloves must be removed in the work area before leaving the lab and or touching door handles, elevator buttons, light switches, phones, etc. [How to Remove Gloves](#) Perform hand hygiene after removing gloves. [Wash Your Hands](#). This prevents contamination of surfaces with chemical or biologicals and exposing others. Carry potentially containment equipment or product in a secondary, leak-proof container. The container must be decontaminated after each use.

References: OSHA 29 CFR 1910.138

11. Are animals used in the laboratory? If yes, do all laboratory personnel have the approval of use, access to IACUC protocol, appropriate training, and animal contact clearance?

All research, testing, and teaching projects involving the use of live vertebrate animals, and personnel, must be reviewed and approved by the [IACUC](#) (Institutional Animal Care and Use Committee). All individuals who will work with or have contact with research animals, their housing equipment, bedding, waste products, etc. must be enrolled in the [Occupational Health and Safety Program](#).

For safety and health standards in laboratories, please reference [OSHA Laboratory Safety Guidance: OSHA3404-11R 2011, 29 CFR 1910.1450](#).

Laboratory Signage

1. Does the laboratory sign posted outside of the laboratory, and/or shared space locations, reflect current information?

Laboratory signs are designed to provide information on the hazards present in the laboratory to service workers and emergency personnel. Lab signs must be updated annually and/or when there are any lab personnel, chemical or process changes. Lab signs must contain a primary and secondary contact, to include a phone number to be reached during business hours. The contact information is provided so those knowledgeable about the hazards can be contacted if more information is needed or in the event, there is a problem in their laboratory.

Labs are also required to provide emergency contact information for emergency notification purposes only. The emergency contact information provided will not be listed on the laboratory sign posted outside of the laboratory entrance. Emergency contact information will only be provided to Security Dispatch, in the event of an emergency situation and contact is needed after hours.

Reference: [Laboratory Safety Signs](#)

2. Are stickers/signs posted to reflect the appropriate hazards on all laboratory equipment?

Laboratory equipment must be posted with any hazardous information. Commonly used stickers in laboratories are listed below.

- **Biohazard symbol stickers:**

Biohazard symbols must be placed on all equipment that is used to with biohazardous materials (i.e., centrifuge, refrigerator, incubator, etc.). Biological materials is defined as materials of biological origin that have the capacity to produce deleterious effects on humans, animals, or plants. This can include medical waste or samples of a microorganism, virus or toxin (from a biological source) that can affect human health. It can also include substances harmful to other animals. Any equipment, container, refrigerator or freezer holding biohazardous materials (including blood) must be marked with a label that clearly states the word "biohazard" and includes the international symbol for biohazard waste. Stickers are available from EHS.

- **Non-explosion Proof Refrigerator/Freezer stickers:**

All non-explosion refrigerators/freezers must have one of these stickers on the front door. This sticker warns individuals not to store flammable liquids within the refrigerator/freezer. Stickers are available from EHS.

- **Not for Use with Food or Drink stickers:**

This sticker must be posted on all microwaves, refrigerators, and freezers, within the laboratory space(s). Food or drink are prohibited within the laboratory. This is to prevent the accidental ingestion of harmful

items if food were to become contaminated. Stickers are available from EHS.

- **Not for Human Consumption stickers:**

This sticker must be posted on all ice machines within the laboratory space areas. This is to prevent the accidental ingestion of harmful items if ice were to become contaminated. Stickers are available from EHS.

- **Radioactive Material stickers:**

Radioactive stickers must be posted on all pieces of equipment, including refrigerators and incubators, lab bench areas and sinks designated for radioactive use or disposal. Handle and store radioactive material only in specifically designated and authorized locations. Laboratory signs posted outside of the door must be labeled to indicate that radioactive material is present within the laboratory space. Stickers are available from EHS.

Laboratory Security

1. **Are acute toxins, select agents, controlled substances, and radioisotopes appropriately secured?**
Acute toxins, select agents, controlled substances and radioisotopes must be appropriately secured (locked) at all times, except for when in use.
2. **Is the lab secure when not occupied?**
Labs must be secured when not occupied, even during business hours. Keeping laboratory areas secured helps prevent damaging or theft of equipment and supplies.
3. **Are lab personnel wearing ID cards at all times?**
I.D. cards must be worn in a visible position above the waist by all students, faculty, staff, and affiliates while on UNMC and Nebraska Medicine property.
4. **Are lab personnel trained to not allow other individuals access with their personal ID card?**
Using another employee or student's I.D. card to enter secured areas is prohibited. Individuals must use their own I.D. card to enter all restricted and secured areas in which they have the authorization to enter. Do not allow access to hallways or floors (via elevators or stair tower doors) to anybody that does not have their own personal I.D. card to allow them to access restricted/secured areas. Not everyone with an I.D. card has the authorization to enter all areas.

Staff should ask those who they are not familiar with if they can help them. Listen to the answers and report questionable people or suspicious activity immediately to security. Do not hesitate to politely question anyone whom you do not recognize or you believe does not belong in the area.

Reference:

[UNMC Identification Card Policy](#), [UNMC Facility Security Policy](#), [UNMC Secure Area Card Access Policy](#)

Laboratory Waste

1. **Are sharps containers available?**
Sharps containers must not be filled above the 3/4 full mark. Sharps containers must be used only for sharps that are potentially contaminated with infectious substances. Approved sharps containers can be purchased via eSHOP. When sharps containers reach the 3/4 full mark, they must be sealed shut and placed within the red biohazard waste bin for pick-up by EVS staff. Sharps must **not** be placed in cardboard boxes or regular trash.

Buffett Cancer Center research labs must follow the [Reusable Sharps Guidelines](#). For more information, contact. If you have any questions about the reusable sharps program, please email LiveGreen@unmc.edu

2. **Is glassware & broken glass being properly disposed of?**
Do not place glassware or broken glass in the regular trash bins. Place empty glass containers and broken glass in a cardboard box/rigid container that is sealed and labeled "BROKEN GLASS/TRASH". Glassware contaminated with Biohazardous materials shall be packaged the same as above (in sharps container) and then placed in the red biohazardous waste bin for pick-up by EVS staff.

3. Are used pipettes and pipette tips being collected in boxes lined with plastic bags?

All pipettes and pipette tips must be collected in plastic lined boxes and disposed as biohazardous waste. Lining pipette disposal box with plastic keeps residual liquids from soaking the box and seeping onto the floor/counter. Once pipette disposal boxes are full, they must be sealed shut and placed within the biohazard waste bin.

Reference:

[Laboratory Safety Manual, Section 10 \(Laboratory Waste\)](#)

Facilities

1. Are all items stored at least 18 inches from the bottom of the automatic sprinkler head?

This ensures adequate sprinkler coverage. In rooms with automatic sprinklers, nothing should penetrate a plane that is 18 inches below the bottom of the sprinkler heads. There are exceptions to this rule for storage or cabinets along perimeter walls as long as there are no heads in close proximity. Contact EHS at (402) 559-6356 with any questions about storage in your area.

Reference: 29 CFR 1910.159

2. Are all boxes, equipment, etc. stored at least 2 inches from the floor?

This allows for floor cleaning and minimizes the damage/loss in the event of a pipe break/flood. Items must not be stored on the floor as this prevents the area from being properly cleaned. Items in boxes stored on the floor can be damaged by spills, water leaks and when the floor is mopped. Items must be elevated at the minimum of 2 inches from the floor.

3. Are there any damaged floor tiles or trip hazards in the lab?

These create safety hazards and can often result in injury. Damaged floor tiles must be reported to Facilities Management at (402) 559-4050.

Reference: 29 CFR 1910.22

4. Are there any damaged ceiling tiles in the lab?

Violates fire codes and can affect the ventilation of an area. [Fast Facts Ceiling Tiles](#) Damaged ceiling tiles must be reported to Facilities Management at (402) 559-4050, or the facilities department on the campus your lab is located.

References: OSHA 29 CFR 1910.37

5. Is the lab designed to be easily cleaned?

No rugs or carpet are allowed in laboratory spaces. This allows for cleaning and spill cleanup. The spaces between benches, cabinets and equipment must be accessible for cleaning. Rugs can create trip hazards.

6. Are chairs at lab benches covered with a non-porous material?

Cloth chairs are not allowed in the laboratory areas. Cloth chairs can harbor spilled chemicals or biohazardous materials and do not allow effective cleaning.

Equipment Management

1. Is there any defective equipment in the lab?

Defective equipment must be labeled as "DO NOT USE". Defective equipment must be repaired, replaced, or submitted for surplus in a timely manner. Communication status of equipment will protect staff and prevent further damage to the equipment. Use of damaged or broken equipment can cause injuries.

New equipment and repaired equipment must be checked before placing into service. Checking equipment for proper operating condition will help prevent injuries. Equipment should be routinely calibrated, cleaned and maintained per manufacturer's specifications. This process will help ensure that the equipment performs as expected during hypothesis testing or validation of research protocol to minimize the hazard to the operator.

2. Are refrigerators in laboratory spaces free from food and drink and appropriately labeled?

No food or drink shall be present in the laboratory, at any time. This is to prevent the accidental ingestion of harmful items if food were to become contaminated.

References:

[No Food or Drink Poster](#)

[UNMC Food, Drinks, and Cosmetic Use in Laboratory Areas Policy #2010](#)

3. Are emergency eyewashes and safety showers free from obstruction?

Keep these areas clear from obstruction at all times. These units are required in areas where substances are present that could cause injury or harm to eyes and skin. Nothing should be placed under or around eyewash stations or emergency showers. The user may not be able to see or have time to move items, in order to activate the eyewash or shower.

4. Are eyewash stations being flushed weekly and the test documented?

Flushing the eyewash stations weekly minimizes the growth of bacteria and accumulation of minerals in the line. Testing needs to be documented and kept on file for one calendar year. Eyewash stations shall be tested and recorded on a weekly basis by laboratory personnel to ensure water flow and quality of each unit.

[Eyewash Weekly Inspection Log](#) This also helps clean out any rust, scale deposits, or bacteria that may accumulate. Some units discharge water on the floor, so you must plan accordingly if you are testing these type of units.

5. Are the safety shower and eyewash stations annually tested by Facilities?

Facilities personnel will not test the unit if access to the unit is blocked. The department will be responsible to pay a re-servicing fee, in the event Facilities is unable to test the unit. The tag on each individual unit will indicate the last test date. The annual testing is conducted by UNMC Facilities Management to ensure each unit meets appropriate standards and regulations. If your unit is in need of an annual inspection, please contact the Facilities Help Desk at (402) 559-4050.

6. Are the fume hood(s) and/or biosafety cabinet(s) certified annually by Facilities?

These units are tagged to indicate the date they were last inspected. The certification assures the unit was functioning properly at the time of the test. If assistance is needed, contact the Facilities Helpdesk at (402) 559-4050.

7. Are fume hoods and/or biosafety cabinets free of clutter and properly maintained?

Be sure that nothing blocks the airflow through the baffles or through the baffle exhaust slots. In fume hoods, elevate large equipment (e.g., a centrifuge) at least two inches off the base of the hood interior. Keep all materials inside the hood at least six inches from the sash opening. When not working in the hood, close the sash.

Reference:

[OSHA Quick Facts: Chemical Fume Hoods](#)

[UNMC Biosafety Cabinet and Fumehood Manual](#)

8. Are compressed gas cylinders appropriately secured in an upright position, and capped when not in use?

All cylinders must be individually secured via chains, straps, carts, carriers, cylinder stands, etc. Assure ring stand bolts are tight. Cylinders cannot be chained together. Cylinders must be capped when not in use to prevent damage to the valve if the tank falls or is struck. A damaged valve on a gas cylinder can cause great damage, injury or death.

Flammable gas cylinders shall be limited to the tank(s) currently in use and only one spare. Based on type and quantity, flammable gases may need to be stored in approved storage rooms or vented cabinets. Storage must be kept to a minimum. Flammable gases may require extra safeguards depending on agent and quantity. Equipment used with flammable gases shall be designed and approved for the application. Using the appropriate equipment that is designed for use with flammable gases helps prevent ignition of gas and explosion.

Reference: OSHA 29 CFR 1910.1926.350

Electrical

1. Is electrical cord insulation on equipment cracked or frayed?

Electrical cords and plugs must be inspected routinely to identify cracked insulation or broken plugs. The hazards associated with the use of electricity include electrical shock and electrical fires caused by shorts and overloaded circuits or wiring. Never obstruct electrical panels or disconnect switches. Any equipment found with damaged cords or plugs must be removed from service until it is repaired.

2. Are extension cords, power strips, or outlet expanders or adapters being used to provide power to any laboratory equipment items?

Equipment such as refrigerators, microwaves, etc. cannot be powered with extension cords, power strips, and outlet expanders and these piece of equipment must be plugged directly into outlets. Extension cords are prohibited as a substitute for permanent building wiring and outlets. Fused circuit power strips may be used for some equipment but they cannot be ganged or daisy chained together.

Overloading circuits is a hazard and may result in a fire. Outlet adapters must not be used because the ground wire is not connected. A grounding system is a safety feature that helps protect you against electrical shock, which can range from startling, to painful, to deadly. If you need assistance with outlets in your laboratory space(s) please contact Facilities Management at (402) 559-4050.

3. Are electrical cords identified and secured so they do not pose a trip or entanglement hazard?

Extension cords must not present above ceiling tile, running through doorways, hallways, walking paths, under rugs or placed near sinks. This use violates code as it may cause damage to the cord causing a short and electrocution. Cords must be identified and secured so they do not post a trip or entanglement hazard.

References: OSHA 29 CFR 1910.334; NFPA 1

Biosafety

1. Does the lab have a red biohazardous waste container(s) that is durable and leak proof?

When full red bags must be properly tied by twisting the bag into a single braid and tying into a single knot. The tied bags are then placed into the rigid biohazardous waste container for pickup by EVS staff. If there are any questions regarding biohazard waste, please contact EHS at (402) 559-6356.

2. Are vacuum flasks which are connected to the vacuum system equipped with an in-line filter, or dual flask, to prevent liquids from being drawn into the vacuum system?

Always label flasks to identify the contents. One filtering flask is appropriate when an in-line membrane filter is provided. The glass or plastic tube that is inserted into the rubber stopper of the filtering flask should extend at least 3 inches below the suction port on the side of the flask. Vacuum operations must be set up and operated with careful consideration of the potential risks. An appropriate trapping system is comprised of a filtering flask, appropriate size tubing (thick enough to prevent collapsing while under a vacuum) and a membrane filter placed prior to the vacuum source.

Numerous filter types are available for this application. As a point of reference, one recommended in-line filter available for purchase in eSHOP: Fischer Scientific, Millipore Millex Vacuum Line Protection, pore size 1.0 um. (Catalog Number: SLFA05010). [Vacuum System Safety Guideline](#)

3. Is there a sink available for hand washing with hand hygiene supplies available (soap and paper towels)?

Items used for hand hygiene must not be stored under the sink, as they can become contaminated if the water supply line or drain lines leak. Sinks must be available for hand washing in each laboratory. Lab personnel must wash their hands prior to leaving the laboratory. Paper towels must be placed within the paper towel holder and not be stacked on the countertops. All items shall be readily available to all individuals needing to use the sink for hand hygiene. No items shall block the access of activating the eyewash (sink) stations.

4. Is the disinfectant type being used in the lab appropriately selected for the effectiveness of use?

Disinfectants in laboratories include, but are not limited to, bleach solution, phenolic, quaternary ammonium, alcohol, etc. Disinfectant shall be selected based on effectiveness and area of use. Over time, solutions can lose their effectiveness.

Reference: [CDC Disinfection Guidelines](#)

5. Is the lab performing any recombinant DNA studies?

Must receive approval through IBC.

6. Is the lab working with any risk group 2 or higher biohazard agents?

Must receive approval through IBC.

7. Is the lab working with biological materials derived from humans or non-human primates?

This includes tissues, blood, primary cells, cell lines, and other potential infectious materials.

If using human-derived material:

- Rooms where non-fixed materials are handled (i.e. tissue culture room) should be labeled BSL-2
- A BSL-2 spill procedure is posted on the BSC.
- Research involving human tissues and primary cells require an IBC

If using non-human primate derived materials:

- If the material is derived from macaques, lab must have a B-virus post-exposure kit (contact Comparative Medicine for details) and an IBC protocol
- Rooms where non-fixed materials are handled (i.e. tissue culture room) should be labeled BSL-2
- A BSL-2 spill procedure is posted on the BSC.

References:

OSHA 29 CFR 1910.1030, [Institutional Biosafety Committee: Policies and Procedures](#)