

Laboratory Safety Audit Checklist

Fire / Life Safety

- **A minimum 3-foot unobstructed aisle space**
A minimum 3-foot aisle space must be maintained throughout each laboratory to allow for a safe egress in an emergency situation.
- **Adjacent corridor area free from lab storage**
The City of Chicago and the National Fire Protection Association Life Safety Code require that hallways and corridors remain free of miscellaneous equipment and/or debris.
- **Access to a fire extinguisher**
Laboratory areas using chemicals must have access to a fire extinguisher. A fire extinguisher should be located to within 50 feet of each laboratory.
- **Laboratory posted emergency procedures / evacuation plans**
Each laboratory should post emergency evacuation plans somewhere by the exit door to the hallway. These plans should contain a map of the laboratory area and a highlighted path of evacuation. Emergency procedures should be available to every laboratory worker. These may be included as an appendix item to the Chemical Hygiene Plan (CHP).
- **Fire extinguisher inspected within one year**
All fire extinguishers must be inspected at least once a year to ensure proper functioning in an emergency situation.
- **Adequate emergency lighting**
Adequate emergency lighting should be provided for a safe egress in an emergency situation.

Chemical Safety

- **Chemical Inventory**
Each laboratory should have a complete inventory of the chemicals used in the lab. This list should be updated any time a new chemical is purchased.
- **Flammables stored separate from corrosives**
Flammables and corrosives should be stored apart from each other. Separate all liquids by hazard class and compatibility, placed below eye level and identify the storage area with an appropriate hazard class label.
- **Liquid acids stored separate from bases**
Acids should be stored in separate cabinets/areas away from bases. They should be stored below eye level. Storage areas containing corrosives should be marked accordingly. Acetic acid is an anic acid and should not be stored with inorganic acids. It is also very reactive with oxidizers such as nitric acid.
- **Chemicals stored by compatibility**
Solids and liquids, organics and inorganics may not be stored together. Separate chemicals by hazard class and compatibility, not alphabetically. Compatibilities of the individual chemicals

within the hazards classes should also be considered when sorting. Storage areas within the laboratory should be identified with universal codes for each hazard class. Contact Greg Taborn at x56511 for more information regarding chemical storage precautions and recommendations.

- **Hazard signs on appropriate cabinets/refrigerator**
Areas that house/contain chemical hazards should be marked and designated with universal hazard signs. Refrigerators within laboratories should be marked "No Food" and refrigerators outside the lab area used for food should be marked "Food Only."
- **Chemical containers properly labeled**
All chemical containers must be appropriately labeled. If the manufacturer's label is damaged or not legible, it should be replaced with a label containing the chemical name, and hazard associated with the chemical. When chemicals are removed from their original container, the new container should be labeled with the chemical name, date and appropriate hazard associated with that chemical.
- **Hazardous liquids stored below eye level**
Hazardous liquids must be stored below eye level to prevent an accidental exposure to the head and eyes.
- **Polymerized/unstable chemicals not present**
Old, polymerized or unstable chemicals should not be kept in the laboratory. Periodically inspect all chemicals for signs of age and instability and proper labeling. Lab workers should assess the probability of future use weighed against the hazard presented by the chemical. If chemicals are no longer needed, but still in good condition, inventory, sort and store them by hazard class and compatibility. Contact Greg Taborn or fill out a Chemical Removal Form to dispose of unwanted chemicals.
- **Peroxidizable chemicals date/tested**
Peroxide-forming substances (e.g. ethers, cyclohexene, dioxane, decalin, diethylene glycol, THF...) Must be dated upon receipt, when initially opened and when tested for presence of peroxides. Check these substances routinely for peroxides. Peroxide-forming substances are usually sold with inhibitors which are active for one year. Commercially available test strips can be a quick way to check for peroxides. Before proceeding, consult Prudent Practices for Disposal of Chemicals from Laboratories. National Academies Press, Washington, B.C. 1983, pg. 73.
- **MSDS available/accessible**
All laboratories should have access to Material Safety Data Sheets for all chemicals used in the laboratory. MSDSs must be readily available and should be placed in a centralized location within the laboratory. The location of the MSDS should be documented in the CHP. Contact the chemical manufacturer/supplier for copies of MSDSs that you do not have. Greg Taborn may also be contacted for a few miscellaneous copies.

Flammable Safety

- **Safety cans used for flammables over one gallon**
Class one flammable liquids (flashpoint below 100°F) with a volume or size of greater than one gallon should be stored in safety cans with a flame arrester and spring-loaded spigot.
- **Safety cabinet used to store flammables**
Up to 10 gallons of Class one flammable liquids may be stored in regular cabinets below eye level. If the lab cannot limit the quantity of flammable liquids on hand, a flammable liquids storage cabinet must be used. Only one flammable liquids storage cabinet should be used for each laboratory. Flammable liquids must not be purchased in quantities exceeding one gallon.
- **Flammable liquid stored in an approved refrigerator**
Flammable liquids should only be stored in refrigerators/freezers that are explosion-proof and listed as Flammable Material Storage Only. Refrigerators made intrinsically safe must first be approved by Underwriters Laboratories. Labs should assess each refrigerator/freezer contents

and ensure that flammables are stored appropriately. Reagents with a flammable sticker on the bottle are considered to be flammable.

Acid, Corrosive, Toxic Chemical Safety

- **Safety cabinet used to store acids**
- **Corrosive liquids should be stored in a safety cabinet for corrosive materials.**
- **Hazardous chemical containers closed**
When not in use, chemical containers should be kept closed at all times to prevent the release of toxic/flammable vapors.
- **Hazardous chemicals used in fume hood**
Work with hazardous chemicals should be performed inside a properly functioning fume hood.
- **Chemical Hygiene Plan available / completed**
The OSHA Lab Standard 1910.1450 requires the development and use of a Chemical Hygiene Plan customized for each laboratory. This should contain important information regarding hazardous chemicals used, emergency procedures etc., and should be completed by each laboratory.

Compressed Gas Safety

- **Compressed gases properly secured**
Compressed gas cylinders must be properly secured to a wall or lab bench. No more than two cylinders should be secured per each device (e.g. chain).
- **Compressed gases with regulator cap on**
Compressed gas cylinders should have the regulator cap on when in use.
- **Limited amount of excess cylinders stored**
No more than two extra compressed gas cylinders should be kept on hand in each laboratory.

Fume Hood Safety

- **Fume hoods are not obstructed**
Fume hoods must be kept free of instrumentation and chemical containers so that they may be used for working with hazardous chemicals.
- **Fume hoods properly functioning**
Fume hoods should be operating properly and have an exhaust capacity at the front sash of at least 100 linear feet per minute. Contact Engineering at x56348 if you have questions about your fume hood.
- **Fume hood evaluated within one year**
All fume hoods must be certified every year to ensure that they are exhausting the proper amount of air. Do not work with hazardous chemicals in a fume hood that has not been certified within a one year time period.
- **Bottle carriers available**
Bottle carriers should be available for use when transporting glass chemical containers outside of the lab.

Biosafety

- **Decontamination procedures available**
Laboratories working with biohazardous/infectious material should have decontamination procedures written to handle accidents / spills. Decontamination spill kits should also be made available for each lab working with infectious material.
- **Contaminated sharps properly disposed**
Contaminated sharps (all needles, syringes, scalpels, razor blades, pipets...) used with potentially infectious material must be properly disposed. An appropriately labeled red, leak proof, puncture-resistant container must be used. Care must be used when disposing of these sharps. Do not overfill disposal containers.
- **Biohazards disposed of appropriately**
Biohazardous material must be disposed of properly in red bags or boxes.
- **Biosafety cabinet certification current**
Biological Safety Cabinets used for working with potentially infectious material must be certified annually.
- **Universal Precautions followed**
Employees working with potentially infectious material must always follow Universal Precautions. Please consult Children's Exposure Control Plan, or contact Infection Control with questions regarding the use of Universal Precautions.
- **Bloodborne Pathogens training within one year**
29 CFR 1910.1030, the Occupational Exposure to Bloodborne Pathogens Standard, requires employees coming into contact with bodily fluids or potentially infectious material to attend a training session annually. Employees should also be familiar with the institution's Exposure Control Plan.

Electrical Safety

- **Power cords not damaged**
Electrical equipment must have power cords that are not damaged in any way. All equipment with damaged electrical cords must be taken out of service until the cords are replaced. Routine checks should be conducted of all electrical equipment.
- **Extension cords used only for computerized equipment**
Extension cords, including power strips, are only allowed with computerized equipment, or for temporary use. These cords may not be over six feet long and must be removed when not in use.
- **Moving parts on mechanical equipment guarded**
Belts/moving machine parts must be guarded. Refrain from using unguarded equipment until a guard has been installed.
- **Electrical outlets secured to wall & closed**
Electrical outlets must be secured properly to the wall, with no exposed wires outside the outlet. Contact Engineering if you have problems with the electrical outlets in your lab.
- **Electrical panel clear and unobstructed**
Electrical panels must remain clear and unobstructed. Do not place anything in front of the electrical panel.

Personal Protective Equipment

- **Eye protection worn & appropriate**
Employees must wear the appropriate eye or face protection when exposed to eye or face hazards from liquid chemicals, chemical gases or vapors, flying particles and/ or injurious light radiation. Consult the Chemical Hygiene Plan or contact Greg Taborn for more information on the proper selection of safety glasses and face protection.
- **Gloves worn and appropriate**
Appropriate gloves must be worn when working with chemicals and bodily fluids. Latex gloves are insufficient when working with chemicals. Contact Greg Taborn for more information on the proper selection of gloves.
- **Protective clothing appropriate**
Proper protective clothing must be worn by employees working in laboratories. A lab coat, apron or impervious gown must be worn, as appropriate when working with hazardous substances. Protective equipment (including gloves) should not be worn outside of the laboratory. Laboratory workers should not wear shorts or any other clothing that exposes large amounts of skin when working with chemicals.
- **Open toed shoes not worn**
Open toed shoes should not be worn in the laboratory. Sandals and canvas shoes must be changed to more protective footwear before entering the laboratory.
- **Safety Shower within 100 feet or 10 seconds travel**
Safety showers must be installed in accessible locations that require no more than 10 seconds travel time or are within 100 feet from the hazard area, or laboratory.
- **Safety Shower tested and tagged within one year**
To ensure proper functioning during an emergency, safety showers and eyewash stations must be tested and marked each time. Contact Engineering to schedule a safety shower test for your laboratory.
- **Eyewash available within 100 feet / 10 seconds travel**
Eyewash stations must be installed in accessible locations that require no more than 10 seconds travel time or within 100 feet from the hazard area, or laboratory. Laboratories should test emergency eyewash stations on a weekly basis and maintain a log documenting these dates.

General Safety

- **Chemical spill kits available**
Researchers working with chemicals should be aware of proper spill clean-up procedures and should be equipped with the appropriate materials. Spill kits must be assembled in accordance with chemical inventory. A generic spill kit would consist of the following: a sodium or calcium carbonate/bentonite/sand (1:1:1 mix w/w) for absorbing acids and bases, sodium or calcium carbonate for neutralizing most absorbed acids, 5% hydrochloric acid for neutralizing most bases, and, activated charcoal, bentonite clay, vermiculite or Oil-Dri for the absorption of most solvents. For more specific information regarding the clean-up of a chemical spill, consult the MSDS or contact Safety Services.
- **Disposal of chemicals according to Lurie Children's policy**
Laboratories using hazardous chemicals must ensure the proper disposal of these substances. Contact Greg Taborn for more information. Researchers wishing to dispose of chemicals should use the Chemical Removal Surplus Form.
- **Safety training within one year**
The OSHA Lab Standard mandates that employees receive annual safety training.

- **Proper disposal container for broken glass and sharps**
Broken glass and uncontaminated pipets must be disposed of in a cardboard box marked BROKEN GLASS. When full, the box must be taped shut and put aside as refuse.
- **Bench areas uncluttered**
Bench areas with laboratories must remain uncluttered and clear of miscellaneous debris. This should enable lab employees to work in a safe manner.
- **No slipping or trip hazards**
Slipping, or trip hazards within laboratories should be identified and remediated.
- **No holes in ceiling or walls**
Holes in walls or ceilings should be reported so that they are fixed as soon as possible. These can present a problem in a fire emergency
- **No food or drink consumed in lab**
Food and drink must be kept outside of the laboratory. Separate areas should be established to accommodate employees who wish to bring their lunch to work.

Reference: United States. Occupational Safety and Health Administration. Laboratory Safety Guidance. Available at <https://www.osha.gov/Publications/laboratory/OSHA3404laboratory-safety-guidance.pdf>. Accessed 6.28.16.