

Chemical Hygiene Plan

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Chemical Hygiene Plan

Policy

It is the policy of Lurie Children's to provide a safe working environment and to inform all laboratory employees of the potential health hazards associated with their work. This policy, known as the Chemical Hygiene Plan, is designed to allow laboratory employees to make knowledgeable decisions concerning the personal risks associated with their employment. This Plan shall include all policies, procedures and responsibilities required to develop an awareness in each laboratory employee of the potentially hazardous chemicals or conditions in either the facility or the actual work procedure. This awareness is achieved by training the employee in all aspects of appropriate and safe working practices. This policy is designed to conform to all State and Federal Acts.

For this policy to be an effective instrument, both employer and employee assume certain responsibilities. Lurie Children's assumes responsibility for providing a safe laboratory environment, the necessary training required for establishing and maintaining that environment and that employees have access to all pertinent safety information through their respective Directors or Team Leaders. Lurie Children's also assures that a training program, has been designed, implemented and maintained for the benefit and protection of all laboratory employees.

The employee assumes responsibility to adhere to all policies, practices and procedures of the Chemical Hygiene Plan, as delineated through the training program. The employee also assumes responsibility to bring to the attention of their respective Directors or Team Leaders any potential health hazards in either their facility or their work practices.

Purpose

The purpose of the Chemical Hygiene Plan is to ensure that each employee of a Lurie Children's laboratory is informed of the potential health hazards associated with their employment and is made aware of the proper policies, practices or procedures to eliminate or reduce such hazards.

Definitions

The Chemical Hygiene Plan utilizes words which may have several or ambiguous meanings. Therefore, for the purpose of this policy, the definitions listed below are the intended meanings.

1. Action Level: A concentration designed in 29 CFR part 1910 for a specific substance, calculated as an 8-hour time-weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.
2. Acute: An effect that develops quickly.
3. Assistant Secretary: Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor or designee.
4. Carcinogen: A chemical that causes cancer. A chemical that is regulated by Occupational Safety and Health Administration (OSHA) as a carcinogen, designated as a carcinogen or potential carcinogen by the International Agency for Research on Cancer (IARC), or listed as a carcinogen or potential carcinogen by the National Toxicology Program (NTP).
5. Chemical Agent: A wide variety of solids, liquids or gasses which have a high potential for entry into the body by various means. Some may be more toxic than others and require special measures of control for safety and environmental reasons.
6. Chemical Hygiene Officer: An Employee who is designated by an employer and who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan.
7. Chemical Hygiene Plan: A written program developed and implemented by an employer which sets forth procedures, equipment, personal protective equipment and work practices that are capable of protecting employees from the health hazards presented by hazardous chemicals used in the workplace.

8. Chronic: An effect that develops slowly over time or that frequently recur.
9. Combustible: Any chemical able to catch fire and burn.
10. Combustible Liquid: Any liquid having a flashpoint at or above 37.8°C, but below 93.3°C, except any mixture whose total volume is 99% or more comprised of components having flashpoints of 93.3°C or higher.
11. Compressed Gas: a) A gas or mixture of gases having in a container an absolute pressure exceeding 40 psi at 70°F (21.1°C); or b) A gas or mixture of gases having, in a container, as absolute pressure exceeding 104 psi at 130°F (54.4°C) regardless of the pressure at 70°F (21.1°C); or c) A liquid, having a vapor pressure exceeding 40 psi at 100°F (37.8°C).
12. Corrosive: A chemical that causes visible destruction of, or irreversible alterations in, living tissue.
13. Designated Area: An area which may be used for work with carcinogens, reproductive toxins or substances which have a high degree of acute toxicity. It may be an entire laboratory, an area of the laboratory or a device such as a laboratory hood.
14. DOT: Department of Transportation
15. Emergency: Any occurrence such as, but not limited to, equipment failure, rupture of containers or failure of control equipment which results in an uncontrolled release of a hazardous chemical into the workplace.
16. Employee: An individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her work.
17. EPA: Environmental Protection Agency
18. Explosive: A chemical that causes a sudden, almost instantaneous release of pressure, gas and heat when subjected to sudden shock, pressure or high temperature.
19. Exposure: Employee subjection to a hazardous chemical by inhalation, ingestion, skin contact or skin absorption.
20. Flammable: Capable of being easily ignited and of burning with extreme rapidity.
21. Flammable Aerosol: An aerosol that yields a flame projection exceeding 18 inches at full valve opening or a flashback at any degree of valve opening, when tested by the method described in 16 Code of Federal Regulations (CFR) 1500.45.
22. Flammable Gas: A gas that forms a flammable mixture, in ambient air, of 13% by volume or less or that forms a range of flammable mixtures, in ambient air, wider than 12% by volume, regardless of the lower limit.
23. Flammable Liquid: A liquid having a flashpoint below 37.8°C, except any mixture having components with flashpoint of 37.8°C or higher, whose total volume is 99% or more of the total volume of the mixture.
24. Flammable Solid: A solid that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns vigorously and persistently as to create a serious hazard.
25. Flashpoint: Minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite.
26. Hazard Warning: Words, pictures, symbols or combination thereof appearing on a label or other appropriate form of warning which convey the hazards of the chemical(s) in the container.
27. Hazardous Chemical: Any chemical which is a physical or health hazard.
28. Health Hazard: A chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "Health Hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives,

sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system and agents which damage the lungs, skin, eyes or mucus membranes. Refer to 29 CFR 1910.1200 for further explanation.

29. Highly Toxic: A chemical falling within the following categories:
- A chemical that has a Median Lethal Dose (LD50) of 50 mg or less per kg of body weight when administered orally to albino rats weighing between 200 and 300 g each.
 - A chemical that has a LD50 of 200 mg or less per kg of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kg each.
 - A chemical that has an LD50 in air of 200 ppm by volume or less of gas or vapor, or 2 mg per L or less of mist, dust or fume, when administered by continuous inhalation for 1 hour (or less if death occurs within an hour) to albino rats weighing between 200 and 300 g each.
30. Immediate Use: Used by and under the control of the person who transfers the hazardous chemical from its labeled container (only within the work shift in which it is transferred).
31. Infectious Agent: Source that causes infections either by inhalation, ingestion or direct contact with the host.
32. Irritant: A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact. A chemical is a skin irritant if, when tested on the intact skin of albino rabbits by methods of 16 CFR 1500.41 for 4 hours exposure or by other appropriate techniques, it results in an empirical score of 5 or more. A chemical is an eye irritant if so determined under the procedure listed in 16 CFR 1500.42 or other appropriate techniques.
33. Label: Any written, printed or graphic material displayed on or affixed to containers of hazardous chemicals.
34. Laboratory: A facility where "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-routine basis.
35. Laboratory Scale: Work with chemicals that can easily and safely be manipulated by one person excluding the commercial production of chemicals for sale.
36. Laboratory Use of Hazardous Chemicals: Handling or use of such chemicals in which all of the following conditions are met; a) Chemical manipulations are carried out on a "Laboratory Scale"; b) Multiple chemical procedures or chemicals are used; c) The procedures involved are not part of a production process, nor in any way simulate a production process; and d) "Protective Laboratory Practices and Equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals.
37. LD50: The concentration of a substance in air that causes death in 50% of the animals exposed by inhalation. A measure of acute toxicity.
38. LD50: The dose that causes death in 50% of the animals exposed by swallowing a chemical agent, a measure of acute toxicity.
39. Material Safety Data Sheets (MSDS): Written or printed materials concerning a hazardous chemical which is prepared in accordance with 29 CFR 1910.1200
40. Medical Consultation: A consultation which takes place between an employee and a licensed physician for the purpose of determining what medical examinations or procedures, if any, are appropriate in cases where significant exposure to a hazardous chemical may have taken place.
41. Mixture: Any combination of 2 or more chemicals if the combination is not, in whole or part, the result of a chemical reaction.
42. Mutagen: Capable of changing cells in such a way that future cell generations are affected. Mutagenic substances are usually considered suspect carcinogens.
43. OSHA: Occupational Safety and Health Administration, the regulatory branch of the Department of Labor concerned with employee safety and health.
44. Organic Peroxide: An organic compound that contains the bivalent "-O-O-" structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atom(s) has been replaced by an organic radical.

45. Oxidizer: A chemical other than a blasting agent or explosive that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.
46. PEL: Permissible Exposure limit. This is the legally allowed concentration in the workplace that is considered a safe exposure for an 8-hour shift, 40 hours per week.
47. pH: A measure of how acidic or basic a chemical agent is on a scale of 1 to 14, whereby a pH of 1 indicates the chemical agent is acidic; and a pH of 14 indicates a chemical agent is basic.
48. Physical Agents: Workplace risk sources, such as heat or excessive noise, recognized for their potential effect on the body.
49. Physical Hazard: A chemical hazard for which there is scientifically valid evidence that it is a combustible liquid, compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water reactive.
50. Protective Laboratory Practices and Equipment: Those laboratory procedures, practices and equipment accepted by laboratory health and safety experts as effective, or that the employer can demonstrate to be effective, in minimizing the potential for employee exposure to hazardous chemicals.
51. Pyrophoric: A chemical that will ignite spontaneously in air at a temperature of 54.4°C or below.
52. Reproductive Toxins: Chemical which affect the reproductive capabilities including chromosomal damage (mutagens) and effects on fetuses (teratogenesis).
53. Sensitizer: A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.
54. Sterility: Changes made in male or female reproductive systems resulting in the inability to reproduce.
55. Target Organ Effects: Signs and symptoms of chemical effects on organs including hepatotoxins, nephrotoxins, neurotoxins, agents that act on the blood or hematopoietic system, agents who damage the lung, reproductive toxins, cutaneous hazards and eye hazards. A categorization of these effects can be found in 29 CFR 1910.1200 Appendix A.
56. Teratogens: A chemical agent that causes a deformity in newborns if significant exposure exists during pregnancy.
57. TLV: Threshold Limit Value: The amount of exposure to a chemical agent, allowable for an employee in an 8-hour day.
58. Toxic: A chemical falling within any of the following categories:
 - A chemical that has an LD50 of more than 50 mg/kg but not more than 500 mg/kg of body weight when administered orally to albino rats weighing between 200 and 300 g each.
 - A chemical that has a LD50 of more than 200 mg/kg but not more than 1,000 mg/kg of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between 2 and 3 kg each.
 - A chemical that has a LD50 in air of more than 200 ppm but not more than 2,000 ppm by volume of gas or vapor, or more than 2 mg/L of mist, fume or dust, when administered by continuous inhalation for 1 hour (or less if death occurs within 1 hour) to albino rats weighing between 200 and 300 g each.
59. Unstable: A chemical which in the pure state or as produced or transported, will vigorously polymerize, decompose, condense or will become self-reactive under conditions of shock, pressure or temperature.
60. Water Reactive: A chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

Responsibilities

Responsibility for safe laboratory practices rests at all levels of the Lurie Children's organization, including, but not limited to the following:

Chief Medical Officer

Has ultimate responsibility for the overall safety of all laboratory employees. These responsibilities include, but are not limited to:

1. Develop, implement, maintain and support the Chemical Hygiene Plan.
2. Review, when warranted (at least yearly) the Chemical Hygiene Plan.

The Chief Medical Officer may delegate responsibilities to appropriate administrative support personnel, as deemed necessary, for support of the institutional Chemical Hygiene Plan.

Chemical Hygiene Officer/Safety Officer

A Lurie Children's employee, whose appointment is essential, and whose responsibilities include, but are not limited to:

1. Work with the various administrative support personnel and other laboratory employees to develop and implement appropriate Chemical Hygiene policy and practices.
2. Monitor procurement, use and disposal of chemicals utilized in the various Lurie Children's laboratories.
3. Assure that appropriate audits, as required, are maintained.
4. Assist Laboratory Directors and Team Leaders in developing adequate precautions and laboratory facilities so as to comply with the Chemical Hygiene Plan.
5. Have a working knowledge of the current legal requirements concerning regulated substances.
6. Continually seek suggestions for all involved personnel on ways to improve laboratory safety and/or the Chemical Hygiene Plan.

The Chemical Hygiene Officer may delegate responsibilities to appropriate administrative support personnel, as deemed necessary, for support of the institutional Chemical Hygiene Plan with the approval of the Chief Executive Officer.

Laboratory Director

A staff appointed physician, or Lurie Children's employee, who has primary responsibility for implementing and maintaining the Chemical Hygiene Plan in their respective laboratories. Responsibilities may include those as listed for Team Leaders.

Laboratory Team Leader

A Lurie Children's employee who has overall responsibility for implementing and maintaining the Chemical Hygiene Plan in their respective laboratory. These responsibilities include, but are not limited to:

1. Ensure that all laboratory employees know and follow the Chemical Hygiene Plan; that protective equipment is available and in working order, and that appropriate training has been provided.
2. Provide for regular, formal inspections, as required by the Chemical Hygiene Plan, including routine inspections of all emergency equipment.
3. Know and understand the current legal requirements concerning regulated substances.
4. Determine the appropriate level of protective apparel and equipment for their laboratory.
5. Ensure that the facilities and training for use of any material present in the laboratory or being ordered are adequate.
6. Report any current or foreseen safety hazards, suggestions or improvements to the Chemical Hygiene Plan, in a timely manner, to the Chemical Hygiene Officer/Safety Committee.

Laboratory Employee

A Lurie Children's laboratory employee whose responsibilities include, but are not limited to:

1. Have acquired a working knowledge of the Chemical Hygiene Plan, as well as all pertinent safety requirements of their respective laboratory through training.
2. Adheres to all policies and practices of the Chemical Hygiene Plan during everyday operations within their respective laboratory.
3. Develops good personal laboratory safety habits.
4. Brings to the attention of the Laboratory Director or Team Leader any hazards identified in either the facility of procedure for their respective laboratory or any suggestion for the improvement of the Chemical Hygiene Plan.

Standard Operating Procedures

Most chemicals present in the laboratory present some form of hazard to the laboratory employee. Therefore, general precautions for the handling of all laboratory chemicals (a mixture of several chemicals should be assumed to be more toxic than the most toxic component) should be adopted so as to minimize exposure.

The following general procedures and precautions are to be used when working in a laboratory containing any chemicals:

1. Accidents and Spills

- a. Eye Contact: Promptly flush eyes with water for a prolonged period (minimum 15 minutes) and seek immediate medical attention.
- b. Ingestion: Encourage the employee to drink large volumes of water. Consult MSDS.
- c. Skin Contact: Promptly flush the affected area with water and remove any contaminated clothing; use a safety shower when contact is extensive. If symptoms persist after washing, seek immediate medical attention.
- d. Clean up: Promptly isolate spill with appropriate absorbent (Spill kits, sand, spill pillows, paper towels, etc.). Leave area if the possibility of significant aerosol production. Address any emergency situations as stated above, i.e., a-c. Obtain MSDS for those hazardous chemicals involved in the spill and notify the Director or Team Leader of the situation. In the event of a significant spill the Director and/or Team Leader must notify the Chemical Hygiene Officer and an assessment of risk should be made. Following appropriate amount of time, clean up the spill, using appropriate protective apparel and equipment. All waste generated from the cleanup is to be considered hazardous chemical waste and be disposed of accordingly.

2. Avoid Unnecessary Exposure to Chemicals

- a. Do not smell or taste any chemicals. Apparatus that can discharge chemicals (vacuum pumps, distillation columns, etc.) should be vented into local exhaust devices.
- b. Do not eat, drink, smoke, chew gum, apply cosmetics or lip balm in areas where laboratory chemicals are present. Always wash hands prior to conducting the above.
- c. Do not store, handle or consume food or beverages in chemical storage areas, refrigerators, glassware, or utensils that are used for laboratory operation.
- d. Do not pipette by mouth.
- e. Shoes must be worn at all times in the laboratory. Shoes must completely cover the foot. Sneakers, sandals, perforated shoes or any shoes made of canvas must not be worn.
- f. Appropriate eye protection, face shields or masks, where necessary (if potential for eye, nose or mouth contamination), must be worn by all employees and visitors in areas where chemicals are stored or handled.
- g. All laboratory employees must wear protective clothing appropriate for the type of possible chemical exposure. At the minimum, all employees must wear laboratory coats. Laboratory coats worn in the laboratory area must be removed immediately prior to

leaving the laboratory area. Should the protective clothing become contaminated with hazardous chemicals, they must be removed immediately. In areas where there is a possibility of splashing of hazardous chemicals, appropriate impervious aprons are to be worn.

- h. When potential for contact with toxic materials exists, the appropriate gloves must be worn. The gloves must be inspected prior to each use and washed prior to removal. If to be used again, gloves must be replaced at periodic intervals.
- i. Avoid the use of contact lenses in the laboratory unless necessary. If used, the Laboratory Director or Team Leader must be informed so that special precautions can be taken in the event of an emergency.
- j. Wash hands thoroughly immediately prior to leaving the laboratory area.
- k. Confine long hair or loose clothing when in the laboratory area.
- l. Keep the laboratory work area clean and uncluttered, with chemicals and equipment properly labeled and stored. Clean up the work area on completion of a procedure or at the end of each shift or day.
- m. All laboratory glassware and apparatus should be handled and stored with care so as to avoid damage. Extra care should be exercised when handling Dewar flasks or other evacuated glassware or apparatus (shield or wrap them so as to contain any chemicals or glass fragments should an implosion occur). Use the glassware and assorted apparatus only for its intended use.
- n. Use any other protective and emergency apparel and equipment as required by the laboratory area or as deemed appropriate.
- o. A hood must be used for operations that might result in the release of toxic chemical vapors or dust. A hood or an adequate ventilation device should be used when working with any volatile substance with a TLV of less than 50 ppm.

Keep materials stored in a hood to an absolute minimum, and store such materials such that they do not block vents or restrict air flow. If materials are stored in the hood, it must be left operating even though no procedures are actively being performed.

Prior to use confirm that the hood or ventilation device is performing adequately.

- a. If appropriate, use respiratory equipment when air contaminate concentrations are not sufficiently restricted by engineering controls. Inspect the respirator immediately prior to each use and on a regular basis.
- b. Do not allow the release of toxic chemicals into environmentally controlled rooms with recirculated atmospheres.
- c. Use only those chemicals for which the quality of the available ventilation system is appropriate.
- d. Always seek information and advice about the hazards, plan appropriate protective procedures and plan positioning of equipment prior to beginning any new procedure.
- e. Be aware of unsafe conditions in the laboratory and report them to the Laboratory Director or Supervisor when detected.

Chemical Inventory

A Chemical Inventory of all chemicals purchased, stored or utilized in laboratories at Lurie Children's will be performed on a yearly basis. The chemical listing will include those classified as hazardous by the DOT, the EPA or those displaying a number of 2 or greater in any section of the National Fire Protection Association (NFPA) diamond. The chemicals are to be listed alphabetically by individual laboratory according to the most commonly used name. One complete Chemical Inventory list for each Lurie Children's laboratory must be submitted to the Chemical Hygiene Officer. Should a laboratory alter its Chemical Inventory in any way during the course of the year, an updated Chemical Inventory must be

submitted to the Chemical Hygiene Officer. A current copy of the Chemical Inventory list must also be maintained in the laboratory and readily available to the employees.

Material Safety Data Sheets

Upon completion of the Chemical Inventory List, each Lurie Children's laboratory must forward a copy of the individual MSDS for those inventoried chemicals, in alphabetical order, to the Chemical Hygiene Officer. The original MSDS for each inventoried chemical must be maintained by the Lurie Children's laboratory in a 3-ringed binder, in alphabetical order, along with the current Chemical Inventory.

It is the responsibility of each Lurie Children's laboratory to verify that each chemical has an appropriate MSDS supplied by the respective manufacturer. Each laboratory, when purchasing a chemical, should request that the MSDS be shipped along with the order. Should no MSDS be supplied with the initial order, the Lurie Children's laboratory must submit to the manufacturer, in writing, a request for the current MSDS. Upon receipt of the MSDS, a copy must be submitted to the Chemical Hygiene Officer prior to the use of that chemical. MSDS may also be obtained via the Internet by using the appropriate manufacturer's website.

Chemical Storage

As a practical approach to protection from chemical hazards, storage of hazardous chemicals are to be kept at the absolute minimum required to operate the laboratory efficiently.

Storage of Corrosives

1. Corrosive materials are to be stored near the floor to minimize breakage from falls.
2. Do not store mutually incompatible chemicals in the same area. Such as: organic acids must not be stored near a strong oxidizer, ie. sulfuric, nitric or perchloric acid. (See appendix for list of incompatible chemicals).
3. Perchloric acid storage in the laboratory area must be limited to a maximum of two, 7 lb bottles. The acid should be stored either in a fume hood so designated for its storage and use or an adequately ventilated area.
4. Perchloric acid must be inspected on a monthly basis for any discoloration and discarded appropriately should it develop.
5. Quantities of greater than 500 ml, are to be carried in Acid Bottle Carriers.

Storage of Flammables

1. Working quantities of flammable or combustible liquids are to be kept at a minimum in the laboratory. They must be stored in an appropriately approved Flammable Storage Cabinets, which have been properly vented.
2. Flammable or combustible materials are to only be stored in appropriate, approved containers.
3. Ignitable solvents should not be used or stored near open flames or other heat sources.
4. The total capacity of flammables and combustibles should not exceed 10 gallons per 5,000 square feet or the total capacity of all approved storage cabinets should not exceed 60 gallons per 5,000 square feet.
5. Flammable Solvent Cabinets are to be placed near the area where the solvents are to be used and there should be no more than 3 cabinets in a single laboratory area.
6. Individual containers of flammables or combustibles within the cabinet are not to exceed 5 gallons.
7. The specified capacity of solvent containers per storage cabinet (See d) should not be exceeded.
8. The cabinets should be located away from all sources of flame, heat or spark producing apparatus.

9. Bottles placed within the cabinet should not touch and are to be located away from the edge of the shelf. Bottles in the rear of the cabinet are not to be lifted over those bottles towards the front; the front bottles should first be removed.
10. Doors to the flammable or combustible cabinets are to be fully closed when not in use and are not to be blocked open.
11. Flammables or combustibles are not to be stored in domestic type or "non-explosion proof" refrigerators. They must be stored in approved (Underwriters Laboratories) "Explosion Proof" refrigerators that have been properly identified as safe for flammable or combustible storage. All "Non-Explosion Proof" refrigerators must be so identified as not acceptable for storage of flammable or combustible chemicals.

Labeling

As a general rule, labels should be prominently displayed on all chemicals in the laboratory so as to maximize information to the employee. The following guidelines are to be adhered to in all Lurie Children's laboratories:

1. All original containers of hazardous chemicals shall be labeled according to OSHA regulations and are to include the identity of the hazardous chemical, the manufacturer of the hazardous chemical, as well as the address and the appropriate hazard warning labels. Should any chemical arrive in any laboratory without the proper labeling, the Director or supervisor should consult the appropriate MSDS and the required information be placed on the container prior to storage and/or usage. Should any chemical arrive in the laboratory without ANY labeling, the chemical should not be accepted and returned to the supplier/manufacturer.
2. Portable, secondary or transfer containers are to be labeled as to the contents and display the appropriate hazard warnings.
3. All Lurie Children's laboratories are to insure that no labels are removed or defaced while the hazardous chemical is in storage or in use within the laboratory.
4. When ordering hazardous chemicals for use in the Department, the Purchase Order Requisition should clearly state, "FORWARD ALL MSDS INFORMATION TO (Specific Laboratory)." Purchasing is to place this statement on the Purchase Order to the hazardous chemical supplier.

Hazardous Chemical Waste Removal/Disposal

To assure that minimal harm to people and the environment will result from disposal of waste laboratory chemicals, a waste disposal site has been located in the Research Building, 1st floor, next to the receiving dock. Safety Services specifies how waste is to be collected, segregated, stored, and transported. Safety Services includes consideration of what materials can be incinerated. All disposal is done in accordance with the Illinois Environmental Protection Agency guidelines.

Certain chemicals are permissible for drain disposal. The Chicago Metropolitan Sanitary District was contacted to determine what was and was not acceptable. Only those chemicals reasonably soluble in water are suitable for drain disposal.

Some exceptions should be noted:

1. Those organics with boiling points less than 50°C.
2. Those hydrocarbons, halogenated hydrocarbons, nitro compounds, mercaptans, and most oxygenated compounds that contain more than 5 carbon atoms (e.g., freon).
3. Those organics that are explosives such as azides and peroxides.
4. Concentrated acids or bases.
5. Highly toxic malodorous or lachrymatory substances.

Indiscriminate disposal by pouring waste chemicals down the drain or adding them to mixed refuse for landfill burial is unacceptable. Hoods are not to be used as a means of disposal for volatile chemicals.

Empty Bottle Disposal

1. Make sure all chemicals are emptied from the bottle. (If small residue amount of liquid remains, place in fume hood to evaporate).
2. Cross out everything on the label.
3. Rinse bottle well with water and label bottle "rinsed with water".
4. Place empty bottle in "broken glass" waste receptacle or take bottle to waste bins on Receiving Dock.

Chemical Disposal Instructions

- a. Complete disposal sheet.
- b. Transport chemicals in approved containers and contact Greg Taborn at x56511 for disposal.

Administrative Controls

The Laboratory Director is responsible for the safe operation of the area.

Environmental monitoring is required in all laboratories for the following chemicals stored or used 3 times/week:

29 CFR 1910 Subpart Z

1910.1001	Asbestos, tremolite, anthophyllite, and actinolite (eff. 7-21-86)
1910.1003	Coal tar pitch volatiles; interpretation of term
1910.1003	4-Nitrobiphenyl
1910.1004	alpha-Naphthylamine
1910.1005	[Reserved]
1910.1006	Methyl chloromethyl ether
1910.1007	3,3' - Dichlorobenzidine (and its salts)
1910.1008	bis-Chloromethyl ether
1910.1009	beta-Naphthylamine
1910.1010	Benzidine
1910.1011	4-Aminodiphenyl
1910.1012	Ethyleneimine
1910.1013	beta-Propiolactone
1910.1014	2-Acetylaminofluorene
1910.1015	4-Dimethylaminoazobenzene
1910.1016	N-Nitrosodiemethylamine
1910.1017	Vinyl chloride
1910.1018	Inorganic arsenic
1910.1025	Lead
1910.1028	Benzene
1910.1029	Coke oven emissions
1910.1043	Cotton dust
1910.1044	1, 2 - dibromo - 3 - chloropropane

Reviewed 6.17.16

- 1910.1045 Acrylonitrile
- 1910.1047 Ethylene oxide
- 1910.1048 Formaldehyde
- 1910.1101 Asbestos

Chemical spills are contained using the Think C.L.E.A.N. Plan:

- Contain the spill.
- Leave the area.
- Emergency: eye wash, shower, medical care.
- Access MSDS.
- Notify supervisor.

Assessment of significant risk of all operations is made by the Laboratory Director or Chemical Hygiene Officer. Chemical Hygiene and safety policies will be established for each task performed and engineering controls or personal protective equipment assigned.

Medical Consultations and Examinations

All employees needing medical attention between the hours of 7 a.m. and 4:30 p.m. Monday-Friday: use NMG Corporate Health, 312.926.8282. After hours: report to the Emergency Department, 312.227.3800.

All medical exams and consultations are performed by or under the direct supervision of a licensed physician.

The employee is sent for medical evaluation:

1. Whenever signs and symptoms associated with a hazardous chemical develop.
2. When environmental monitoring reveals an exposure level routinely above the action level.
3. Whenever an event takes place in the work area such as a spill, leak or explosion resulting in hazardous chemical exposure.

The laboratory provides the following information to the physician:

1. Identity of the hazardous chemical(s) to which the employee may have been exposed.
2. A description of the conditions under which the exposure occurred -- including quantitative exposure data (if available).
3. A description of the signs and symptoms of exposure.
4. A copy of the MSDS for the chemical(s) involved.

The physician provides a written opinion that will not reveal specific finding of diagnosis unrelated to the exposure but will include:

1. Any recommendations for further medical follow-up.
2. Results of the medical exam and any associated tests.
3. Any medical conditions that may be revealed in the course of the exam that may place the employee at increased risk as a result of exposure to a hazardous chemical found in the workplace.
4. A statement by the physician that the employee has been informed of the consultation/examination results and any medical condition that may require further examination or treatment.

Training

Training is an important part of the Chemical Hygiene Plan. All employees must be trained at the time of initial assignment to a work area involving hazardous chemicals and before assignments involving new exposure situations. Refresher and retraining must be held periodically -- no less than annually. All training is documented in writing by attendance record.

Training Objectives

Upon completion of the Chemical Hygiene Training Program, the employee should be able to:

1. Locate potentially hazardous chemicals in the workplace.
2. Recognize the chemical labeling and its meaning.
3. Locate the MSDS book in the workplace.
4. Locate the health hazard, physical hazard, environmental protection, and special sections of the MSDS and explain their use.
5. Identify the Chemical Hygiene Officer by name and title.
6. Discuss the major components of the lab's standard labeling system.
7. Identify the appropriate protective clothing for the area and demonstrate its use.
8. Demonstrate emergency procedures in the event of a hazardous chemical spill.

Housekeeping

Floors are cleaned regularly by Environmental Services. All housekeeping attendants are trained in the risks associated with working in a laboratory.

The Environmental Services supervisors conduct regular inspections of the lab area to assess whether:

1. Stairwells and hallways are free of obstructions.
2. Waste is deposited in appropriate receptacles and properly removed from lab.
3. Chemical spills are cleaned according to Administrative Policy H-6 "Hazardous Materials and Waste Management Plan."
4. Proper storage is maintained to minimize clutter.

Recordkeeping

The Laboratory Director will establish and maintain accurate records for each employee that include the following:

- Training documentation
- Environmental and/or personal monitoring results
- Inventory and usage records for high risk substances

The Employee Health Services Team will establish and maintain medical consultation records and employee accident/illness reports.

All records are kept, transferred, and made available in accordance with 29 CFR 1910.20.

References

1. U.S. Department of Labor, final rule part II. Federal Register 29 CFR Part 1910. Occupational Exposure to Hazardous Chemicals in Laboratories, Wednesday, January 31, 1990.
2. National Research Council. Prudent Practices for Handling Hazardous Chemicals in Laboratories, National Academies Press, 1985.
3. National Research Council. Prudent Practices for Disposal of Chemicals from Laboratories, National Academies Press, 1983.

Reviewed 6.17.16