

# MOUNT SINAI SCHOOL OF MEDICINE

## LABORATORY STANDARD ~ CHEMICAL HYGIENE PLAN TRAINING SESSION ~ PHILIP G. HAUCK, MS, CIH

### 1.0 INTRODUCTION

The main focus of this session is to acquaint the attendees with the requirements of OSHA's Laboratory Standard (29CFR1910.1450), and the required Chemical Hygiene Plan developed by MSSM. Additional information on the EPA's RCRA regulation covering laboratories will be presented.

The Chemical Hygiene Plan booklet should be printed out and kept in all Medical School laboratories. Each researcher is responsible for knowing the procedures outlined in the booklet.

### 2.0 The MSSM Chemical Hygiene Plan

The booklet contains:

#### 2.1. MSSM - CHP Pages 1- 19 (Part1):

[http://www.mssm.edu/health\\_safety/pdf/chemical\\_hygiene\\_parti.pdf](http://www.mssm.edu/health_safety/pdf/chemical_hygiene_parti.pdf)

This is **required reading** for all laboratory employees, since this is the outline of procedures and practices to be adhered to in order to ensure a safe research environment

#### 2.2. OSHA 29CFR 1910.1450: Pages 2-12 (Part 2):

[http://www.mssm.edu/health\\_safety/pdf/chemical\\_hygiene\\_partii.pdf](http://www.mssm.edu/health_safety/pdf/chemical_hygiene_partii.pdf)

Contains the *definitions* section and the framework of the law. Part 1, Pages 7-9 has the Section (e) Chemical Hygiene Plan--General, which is the main operating premises of the Laboratory Standard.

#### 2.3. Appendix 'A' to the Laboratory Standard: Pages 13-34:

Although not binding as law this section is a distillation of "**Prudent Practices for Handling Hazardous Chemicals in Laboratories**", published by the National Research Council. Section D, *Components of the Chemical Hygiene Plan*, and E. *Basic Rules for working with Chemicals* ( Pages 19-30) should be read and understood by all researchers, since these two sections are incorporated into Mount Sinai's CHP and are the basic requirements for working with chemicals in a lab.

### 3.0 Material Safety Data Sheets

3.1.0. Need to collect and maintain in each laboratory for every chemical.

3.2.0. What to look for on the MSDS

3.2.1. Chemical Identity

3.2.2. Hazardous Ingredients/Identity information

3.2.3. Physical/chemical characteristics

3.2.4. Fire and Explosion Hazard Data

3.2.5. Reactivity Data (Hazardous by-products/incompatible)

3.2.6. Health Hazard Data - Essential for highly toxic materials

3.2.7. Precautions for safe handling and use

3.2.8. Control measures (PPE)

**3.3.0.** Other information on toxicity and hazards

- 3.3.1. Labeling on containers (toxic, flammable)
- 3.3.2. NFPA - ratings (part of labeling on package)
- 3.3.3. Library references – Toxicology web bases
- 3.3.4. Toxicology reference
- 3.3.5. Medline & other data bases
- 3.3.6. NIOSH, EPA, OSHA WEB Sites on Internet

**4.0.** **Standard Operating Procedures ( S.O.P.'s )**

**4.1.0.** OSHA - requires development of SOP's for all carcinogenic and toxic materials handled in the laboratory. On the MSSM Health and Safety website there is an SOP for chemicals of low to moderate toxicity, using the cut-off point of 500 mg/kg oral or inhalation route for a given chemical.

**4.2.0.** Specific SOP's have to be **written** by the Responsible Investigator for defined **Prior Approval** materials. This is nothing more than the research protocols using the chemical *written out*, with specific items or practices noted as follows.

- 4.2.1. Specify particular Hazards for chemicals that are being used in the protocols, and protection methods to be used by a researcher to protect from exposure. Attach MSDSs for the chemical to the SOP.
- 4.2.2. Specify how all protection is to be used (includes all safety specifications i.e., chemical hoods, types of gloves, aprons, suits, type of respirator).
- 4.2.3. How the chemical will be received, stored, used and finally disposed of by the laboratory.
- 4.2.4. How exposures will be detected and prevented.
- 4.2.5. What to do in an emergency situation (spill, over-exposure, medical emergency).
- 4.2.6. Emergency Contact people and numbers should be handy in the protocol.

**5.0.** **Exposure Prevention / Reduction Practices**

**5.1.0.** Laboratory Risk assessment/Reduction can be performed in each lab:

- 5.1.1. Substitution of less hazardous chemical(s) for dangerous chemicals
- 5.1.2. Redesign of experimental systems (design-out exposures)
- 5.1.3. Closed systems (Glove boxes, special containers) used instead of open bench.
- 5.1.4. Special equipment (enclosed hoods, centrifuge safety cups, pipetting devices)
- 5.1.5. Scaling down Procedures (use micro chemical techniques)
- 5.1.6. Personal Protection Equipment (personal use of gloves, respirators, face shields)

**6.0.** **Medical Surveillance**

**6.1.** Provide for Physician evaluation (through Employee Health Services) for any signs and symptoms associated with a hazardous chemical.

**6.2.0.** Provide medical surveillance if exposure monitoring reveals that exposure levels are routinely above the Action Level or Permissible Exposure Level.

**6.3.0.** Provide the following information to the Physician

- 6.3.1. Identity of hazardous chemical
- 6.3.2. Description of exposure conditions, including any quantitative exposure data.
- 6.3.3. Description of signs and symptoms

**6.4.0.** Physician issues a written opinion that will be given to the Responsible Investigator in charge of the laboratory. Page 22 of the CHP, *Laboratory Standard*, section (g) *Medical consultation and medical examinations* has the legal requirements for reporting medical findings to an employee.

**6.5.0.** All medical records will be maintained for the length of employment plus 30 years past termination date.

**7.0. Suspected Exposure**

**GO TO the Emergency Department or to the Employee Health Service depending on the severity of the reaction**

**7.1.0. Non-Emergency**

**7.1.1.** Association of symptoms with work (i.e., only Monday – Friday) when working with chemical

**7.1.2.** If your signs or symptoms are similar to those on the MSDS or SOP Go to the MSMC Employee Health Service for an evaluation-especially for allergenic agents and toxins

**7.2.0. Accidental exposure, spill or other release that causes an exposure – call "60" Security**

**7.2.1.** If a person is not ambulatory: CALL EXT. "60" and notify Security immediately! Give all details about the chemical and the exposure situation.

**7.2.2.** If a person is ambulatory: GET THE INDIVIDUAL TO the MSH EMERGENCY DEPARTMENT IMMEDIATELY!

**7.2.3.** Notify Security ,ext "60" and have Safety paged in order to obtain spill clean-up and control of the chemical

**7.3.0. Prepare *Agent Summary Cards* (have ready for MSH-ED staff or Paramedics)**

**7.3.1.** Name of Chemical

**7.3.2.** Symptoms and signs of over-exposure, poisoning, adverse reaction

**7.3.3.** Treatment (s) for poisoning if known; The Biosafety officer can help obtain information

**7.3.4.** RTECS / CAS numbers-important for using toxicology databases and State Poison Control

**8.0 Chemical Storage and Waste Handling**

**8.1.0 Chemicals in Inventory**

**8.1.1** Permanent Labels with no abbreviations for stock reagents (no vinyl tape/"sharpie" marks)

**8.1.2** Permanent Labels on stock solutions and media containers

**8.1.3** Chemical containers have current opening or inventory dates

**8.1.4** Chemical containers are clean, with intact caps, labels.

**8.1.5** Chemicals exhibit no signs of deterioration or formation of peroxides or container degradation.

**8.2.0 Waste Chemicals**

**8.2.1** Collected in containers with a waste label with words "HAZARDOUS WASTE" and START DATE that the first quantities of chemical were placed in the container.

**8.2.2** Containers remain in close proximity of any devices generating waste i.e. HPLCs, Flow Cytometers and are closed and sealed between each use.

**8.2.3** Containers are kept until full (only one liter of acutely hazardous waste can be collected)

**8.2.4** Containers of waste are offered to Safety 3 DAYS after filling and closing.

**8.2.5** A Chemical Disposal is arranged by calling 47233 (4-SAFE).

**8.2.6** UNKNOWN chemicals, containers with no labels or unknown abbreviations are considered DANGEROUS and likely to be HAZARDOUS WASTES and are to be disposed of immediately following the waste disposal procedures outlined in this section.

**9.0 Training**

If any of this information is unclear to you, you can request specific training at your worksite by: Calling Ext 47233, Kevin McQuillan or Ext. 41451, Philip Hauck