Quarterly Safety Meeting
Winter

Meeting Title: **Hazardous Chemicals in the Laboratory**

Instructional Objectives:

1. The employee will demonstrate, by answering the review questions, knowledge of:

* The federal regulations dealing with this issue and where a copy of the regulations may be found for review.

* The written departmental Chemical Hygiene Plan, what it contains and where it can be found for review.

* What are Permissible Exposure Limits (PEL's) and which of the substances, used in our lab, require monitoring.

* Monitoring methods and activities in our laboratory.

* Where to find more information on PEL's, hazards, safe handling, storage and disposal (i.e. Material Safety Data Sheets and other reference material.)

* The proper response to the release of hazardous materials.

* Where to find the information on physical and health hazards of chemicals used in the laboratory.

* Work practices, engineering controls and other measures to prevent routine exposure and emergency procedures to handle spills and accidental releases.

* Where to find information on signs and symptoms of exposure to hazardous chemicals used in the laboratory.

Topics and Activities:

1. Background

Begin the discussion with the presentation of the written regulations. Show the group your copy of the Code of Federal Regulations (CFR) section 1910.1450 and tell them that the copy is kept in every lab (show them where). It is there for everyone's use. The law is intended to protect workers through hazard communication, specific regulations and training. This law calls for employers to have a *Chemical Hygiene Plan* under the direction of a *Chemical Hygiene Officer* to accomplish this task. Often called the "Right-to-Know Law", the specific version for laboratories replaced the earlier "industrial version" in January 1990.

The Code of Federal Regulation-- Part 1910 is the Federal Occupational Safety and Health Standards and 1910.1450 is the specific section dealing with hazardous materials in the laboratory.

2. The Chemical Hygiene Plan

Refer to the departmental safety manual and show employees the written Chemical Hygiene Plan and remind employees that Dan Haun is the designated Chemical Hygiene Officer.

Briefly show employees how the plan details responsibilities and relationships of personnel and then show the policies, regulations and activities which are designed to ensure a safe work environment.

Take time to review the policies and regulations sections with the employees.

Show employees the glossary of terms.

3. Exposure, PEL's and Monitoring:

Explain the concept of Permissible Exposure Limits (PEL's) which are published by OSHA.

The PEL is the upper limit of allowable exposure and is expressed as an 8 hr. *Time Weighted Average* (TWA) ,the average exposure over an 8 hr. shift and a Short Term Exposure Limit (STEL), the limit in any 15 minute *peak* exposure.

In our laboratory, it is possible for personnel to be exposed at (or near) the limits when working with formaldehyde and we routinely monitor exposure to formaldehyde. Periodically, we ask doctors, techs. and sometimes other personnel to wear exposure monitoring badges-- either all day to measure the TWA or during a peak exposure time for 15 minutes to measure the short term exposure.

The results of each test are posted shortly after completion. If any monitors exceed the permissible limits we must take corrective action to protect employees and we must monitor the employee's health with *Medical Surveillance (*employees are monitored through the Health Clinic) . For formaldehyde, there is another limit, called the *action limit,* where we take corrective action even before the levels rise to the permissible limit. All of these activities are detailed in the written plan.

PEL and action limits:	
Formaldehyde:	
PEL for 8 h TWA	0.75 parts per million (ppm)
Action Limit for 8 h TWA	0.5 ppm
STEL for 15 min. peak exposure	2.0 ppm
Note that you can smell formaldehyde at about .8 ppm but after a while you can become accustomed to it. The smell is an indicator that the level is too high.	
Xylene	
PEL for 8h TWA	100 ppm
STEL for 15 min. peak exposure	150 ppm

3. Signs and Symptoms of Exposure:

Even though we have monitoring activities, you still can exhibit symptoms of exposure--even below the threshold. You must be familiar with the symptoms of exposure so that you can monitor yourself (for Histopathology, distribute the symptoms information sheet). You can find the symptoms of exposure for any product in the material safety data sheet (MSDS- more on these below). If you think that you have any symptom of exposure you need to tell your supervisor. Medical consultation or counseling is available --free of charge.

4. Hazard Information-- Labels, MSDS's and other sources:

Information on chemical hazards starts with the product label. Commercially prepared hazardous products carry warning or caution labels with specific handling instructions. The National Fire Protection Agency label system is widely used.

Review the meaning of the colors on the NFPA type label and the significance of the numbers with all employees.

The MSDS is the information sheet required by the "right-to know" law and it contains all of the identification data, exposure limits, hazardous ingredient information, physical characteristics, fire and explosion data, health hazards, reactivity data, spill and disposal procedures, protective equipment recommendation, and storage and handling precautions.

Select an MSDS for a chemical substance that's commonly used in your lab and point out all of the sections.

Show all personnel where the MSDS file is kept and the printout of your chemical inventory with the hazard ratings.

Chemical Storage: (New for 2000)

Acids cannot be stored with bases.
Organic acids (carbon-based -*e.g.acetic acid*) cannot be stored with inorganic acids.
Neither acids nor bases may be stored with flammables.

Flammable Cabinets: All cabinets have the capacity noted in gallons (usually 60). As we utilize them, the cabinet vents must be capped or plugged tightly. You will be compromising the cabinet if you remove the plugs --so don't.

You can store up to 1 gallon of flammable liquid per 100 sq. feet of lab space. Our audit in 2000 indicated that we are well within the guideline.

5. The Safe Use of Chemicals

The protective equipment section of the MSDS relates to the use of the product in an industrial setting. The laboratory regulations specifically define use of chemicals at the *laboratory scale.* Protective equipment use and regulations over and above universal precautions are *not* necessary for laboratory scale applications. Carcinogens and other special hazards are exceptions.

Laboratory Scale - The use of chemicals where the containers used for reactions, transfers and other handling of substances are designed to be easily and safely manipulated by one person.

Universal Precautions:
All chemical substances are to be considered hazardous from the standpoint of:
1. avoidance of skin and mucosal contact by use of personal protective equipment: protective gloves , and chemically resistant clothing in potential contact situations. Good work practices to avoid spillage and accidents are essential to good chemical hygiene, as are clean, well-lighted, well-ventilated and well-organized work spaces.

2. avoidance of ingestion by the use of proper transfer devices (i.e. no mouth siphoning, no mouth pipetting).

3. avoidance of inhalation of dry chemicals, airborne fibers or chemical fumes by working in well-ventilated areas and the use of fume hoods when working with volatile substances.

Highlight the carcinogen regulations and talk about your own carcinogens, review the storage and access restrictions, the labeling requirement and the use of the log book to record exposure.

Carcinogens:
Carcinogens, by category, require additional regulations related to storage and use .

Groups 1 and 2a compound access is limited to designated personnel and is under the direct control of the area supervisor. An employee exposure log is maintained by substance, and includes employee name, date, and length of time of exposure. Carcinogenic compounds are used under fume hoods with protective gloves and clothing. Medical monitoring, on a by substance basis, is performed in accordance with regulations related to the substance.

Group 2b compounds are handled using the universal precautions.

Protective equipment for the use of all hazardous chemicals:
Throughout the Department:

Discuss the concept of protective equipment

- Personal protective equipment:
  - Protective clothing
  - Disposable vinyl or latex gloves
- Fire response equipment:
  - Fire alarm, fire phone, 2-5000
  - Fire extinguishers
- In certain areas as appropriate:
  - Acid carriers
  - Eyewash stations
  - Safety Showers
  - Chemical Fume Hoods:
  - Spill Response Equipment
  - Rubber aprons, eyewear, special gloves.

Review the need for, locations of and demonstrate the use of the eyewash and shower equipment.

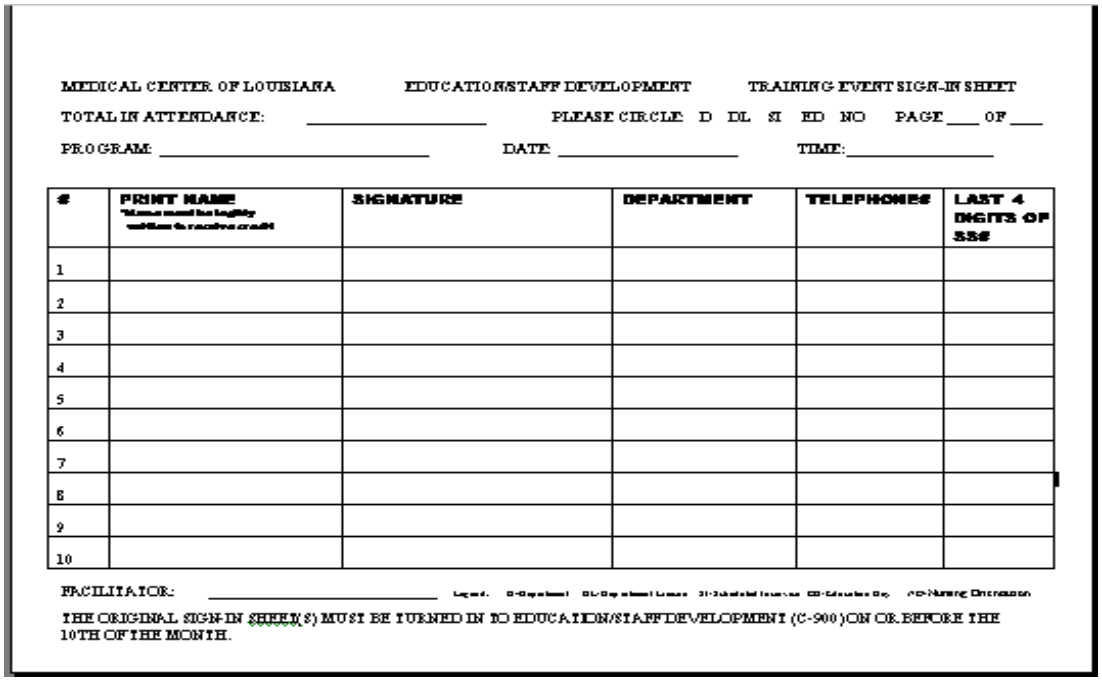
Review the work restrictions for hood use in your area (as appropriate).

Check contents of and show people the spill kit. Review the use of each item.

Emergency Responses:

Review the spill notification (spill team number 903-0057) and written spill response procedure. Note that the hospital now has security personnel trained in self contained breathing apparatus (SCBA) and they can be summoned in cases of big spills.

Finally:
1. Initiate discussion of the topics and answer questions.
2. Have everyone complete the quiz.
3. Review the quiz and correct any errors.
4. Document attendance at the meeting, keep the quiz in your files.
5. Calculate the percentage of attendance in your area.
6. Sign-in sheets have changed use new version and please send original to me by February 14, 2003 indicate faciliator, time and date meeting was held.



MEDICAL CENTER OF LOUISIANA EDUCATION/STAFF DEVELOPMENT TRAINING EVENT SIGN-IN SHEET

TOTAL IN ATTENDANCE: _____ PLEASE CIRCLE: D DL SI ED NO PAGE ___ OF ___

PROGRAM: _____ DATE: _____ TIME: _____

#	PRINT NAME	SIGNATURE	DEPARTMENT	TELEPHONE#	LAST 4 DIGITS OF SS#
1					
2					
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FACILITATOR: _____

THE ORIGINAL SIGN-IN SHEET(S) MUST BE TURNED IN TO EDUCATION/STAFFDEVELOPMENT (C-900) ON OR BEFORE THE 10TH OF THE MONTH.

Meeting: **Hazardous Chemicals in the Laboratory, Winter 2003**
Date: _____
Meeting coordinator: _____
Area: _____
Percentage of attendance: _____

Please write any unresolved discussion questions or safety concerns on the back of this form and return both (form and sign-in sheet) to Argie Leach.