

UNIVERSITY OF KANSAS - LAWRENCE CAMPUS

LABORATORY SAFETY MANUAL

PART II -Chemical Hygiene/Safety Plan

Section 5) Medical Factors to Consider in Chemical Safety

5.1) Introduction

This chapter identifies several medical factors (not necessarily complete) that may need to be considered in the establishment of laboratory-specific safety requirements and/or procedures when hazardous chemicals are being used. This chapter should be used together with Chapter 5 of Part I on exposure assessment and medical surveillance.

5.2) Medical Factors in Evaluating Access Restriction

The Authorized Laboratory Supervisor shall:

5.2.1) Individuals with allergies or chemical sensitivities

5.2.1.1) Determine whether there are any individuals within their lab(s) who may be allergic or sensitive to chemical products that are utilized and may become airborne in the laboratory. If there are, then laboratory-specific operating procedures shall be developed to protect these individuals from exposure. This may include providing special respiratory protection to such individuals if evaluation of the working conditions indicates the need for such protection.

5.3) Medical Care

The Authorized Laboratory Supervisor shall:

5.3.1) Emergency Response to Exposure to Hazardous Chemicals

5.3.1.1) Add laboratory-specific procedures to the general emergency procedures described in I-2.9 and I-5.3 that address any actions that need to be taken very quickly to reduce the magnitude of the medical consequences of the emergency if an evaluation indicates the need. The responding and attending medical services personnel need to know to what hazardous chemical(s) the person was exposed.

For example: these might include specific actions that can be taken immediately if an individual self-inoculates the chemicals through an accident with sharps; or is contaminated by a spill.

Note: There may be no action other than obtaining medical assistance as soon as possible but the possibility that there are actions that could be taken needs to be explored.

5.3.2) Effects of Chronic Exposure

5.3.2.1) Evaluate the risk of long-term adverse health effects subject to on-going exposure to the chemicals being used. If there are unique symptoms that need to be monitored or if there are medical tests that can monitor the status of exposure, appropriate provisions for such monitoring must be included in the Laboratory Standard Operating Procedures if the level of risk requires it.

5.3.3) Effects of Acute Exposure

5.3.3.1) Evaluate the risk associated with potential acute exposure (skin contamination, ingestion, or inhalation) to the chemicals agents in the laboratory and determine whether procedures need to be in place for responding to individuals who develop symptoms associated with such exposure.

5.3.4) Public Health Issues

5.3.4.1) Evaluate the potential for a public health risk associated with the use of the chemicals and the need for procedures that would minimize the risk of public health problems.

Note: Hopefully, in most cases, the evaluation will show that there is little cause for concern. The Authorized Laboratory Supervisor is responsible for having thoroughly researched and identified what is known concerning the risks associated with the chemicals the Authorized Laboratory Supervisor proposes to use.

5.4) Chemicals Requiring Mandatory Medical Surveillance

Federal regulations (29 CFR 1910 Subpart Z) identify several specific chemical compounds for which medical surveillance is mandated for individuals who are working with or in areas containing these compounds. Some are required just because of the chemical type, while others require medical surveillance only if the individual will be exposed at or above an action level that has been specified for the compound.

5.4.1) Medical Surveillance Due to Chemical Type

The Authorized Laboratory Supervisor shall:

5.4.1.1) Immediately contact EHS to determine the appropriate medical surveillance protocols if any of the following compounds are present in his/her laboratory:

OSHA Listed Carcinogens

4-Nitrobiphenyl

a-Naphthylamine

Methyl Chloromethyl Ether

3,3'-Dichlorobenzidine

bis-Chloromethyl Ether

b-Naphthylamine

Benzidine

4-Aminodiphenyl

Ethyleneimine

b-Propiolactone

2-Acetylaminofluorene

4-Dimethylaminoazo-benzene

N-Nitrosodimethylamine

5.4.2) Medical Surveillance Based on Action Levels

The Authorized Laboratory Supervisor shall:

5.4.2.1) Immediately contact EHS to determine the appropriate medical surveillance protocols if any of the following compounds are present in his/her laboratory and laboratory users/occupants may be exposed at or above the identified action level for each compound.

| <u>Compound</u> | <u>Action Level (Airborne Exposure)</u> |
|-----------------------------|---|
| Acrylonitrile | 1.0 ppm |
| Arsenic (Inorganic) | 5.0 ug/m ³ |
| Asbestos | 0.1 fiber/cc |
| Benzene | 0.5 ppm |
| Beryllium | 0.1 µg/m ³ |
| 1,3-Butadiene. | 0.5 ppm |
| Cadmium | 2.5 ug/m ³ |
| Chromium (VI) | 2.5 µg/m ³ |
| 1,2-dibromo-3-chloropropane | 1.0 ppb |
| Ethylene Oxide | 0.5 ppm |
| Formaldehyde | 0.5 ppm |
| Lead | 30.0 ug/m ³ |
| Methylene Chloride | 12.5 ppm |
| Methylenedianiline | 5.0 ppb |
| Vinyl Chloride | 0.5 ppm |

5.4.2.2) Contact EHS to have the appropriate exposure assessments performed to determine airborne concentrations of chemicals identified above.

5.4.3) Medical Surveillance for Other Chemical Exposures

The Authorized Laboratory Supervisor and other laboratory users/occupants who are exposed to chemicals shall:

5.4.3.1) Comply with the Medical Surveillance requirements specified in Chapter 5 of Part 1 of this manual.