**SUBJECT: Laboratory Chemical Hygiene Plan**

**Purpose:**

It is the policy of New Vision Laboratories- Joint Township District Memorial Hospital, to provide a safe working environment where employees have a **right to know and understand** about the chemical health hazards associated with their work. This Chemical Hygiene Plan includes policies, procedures, and responsibilities designed to develop in employees an awareness of potentially hazardous chemicals in the workplace and train employees in appropriate safe working conditions.

As a user of many chemicals, the Laboratory has the responsibility to maintain proper control of the ordering, storage, use and disposal of these materials, thereby preventing adverse effects from occurring to those employees who are handling, transporting, or disposing of the chemicals. The Laboratory will provide a safe, efficient, and effective written Chemical Hygiene Plan that sets forth procedures, equipment, personal protective equipment, and work practices that protect employees from the health hazards presented by hazardous chemical in the workplace. Furthermore, the CHP monitors and controls the ordering, transport and storage of chemicals and disposal of chemical waste; establishes a contingency plan for chemical spills; provides education and protection for employees as well as for property and the environment; ensures compliance with all related federal, state, and local regulations; and has the goal to minimize the use of dangerous chemicals throughout the laboratory. It is important that both employers and employees assume responsibility for Laboratory Safety.

# PROCEDURE

**Responsible Individuals:**

The Safety Committee is made up of representatives from multiple departments within the JTDMH hospital. This committee in conjunction with the following individuals will oversee the development, implementation, and administration of the Chemical Hygiene Plan. If safety concerns arise, employees are encouraged to contact one of these individuals.

* 1. Director Safety JTDMH, Dawn Gable
  2. Director of Facilities, Craig Oldiges
  3. Laboratory Manager, Thomas Geis MT(SACP)
  4. Laboratory Safety Officer, Michele Homan, MLT(ASCP)

1. **Laboratory Safety Committee**

The members of this committee serve as Chemical Hygiene Officers and will:

* 1. Work with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices.
  2. Monitor procurement, use, and disposal of acutely hazardous chemicals used in the laboratory.
  3. Ensure that appropriate audits are maintained.
  4. Seek ways to improve the chemical hygiene program.
  5. Review effectiveness of Chemical Hygiene Plan annually

1. **Laboratory Operations Manager and the Laboratory Safety Officer**
   1. These individuals have overall responsibility for chemical hygiene and safety in their individual laboratory. They are responsible for the following:
   2. Ensure that workers know and follow the Chemical Hygiene Plan
   3. Ensure that protective equipment is available and in working order, and that appropriate training has been provided.
   4. Maintain an updated chemical inventory list with hazardous chemicals classified.
   5. Maintain appropriate Safety Data Sheets (SDS)
   6. Perform annual Laboratory Safety Inspections and rectify any issues that arise.
   7. Conduct annual employee training of Chemical Hygiene Plan and safety training.
   8. Ensure chemicals are labeled appropriately with NFPA or GHS chemical labeling system.
   9. Provide regular, formal chemical hygiene and housekeeping inspections.

1. **Laboratory Employee**

Each employee is responsible to follow the Chemical Hygiene Plan to ensure their own safety as well as their co-workers. They will be responsible to:

* 1. Understand and follow the Chemical Hygiene Plan
  2. Develop good personal chemical hygiene habits.
  3. Wear Personal Protective Equipment appropriate for the task performed.
  4. Complete required annual training and ask questions if needed to ensure thorough understanding of Chemical Hygiene Plan

1. **Hazard Communication Plan**
   1. Hazard Communication is a necessary and important part of the Chemical Hygiene Plan. Safety training is provided for employees through computer-based learning upon employment, with refresher training annually thereafter, or if a new hazardous chemical is added to the work area. Training is coordinated by the Laboratory Safety Officer who is a member of the Hospital Safety Committee, or by the Laboratory Operations Manager or their designee.

This program serves as the basis for employees being educated in chemical safety, in conjunction with computer-based learning modules in Net Learning and I-Learns.

1. **Hazard Communication Objectives**

Upon completion of the Chemical Hygiene and Safety Training Program, the employee will be able to:

* 1. Discuss the content and location of the Chemical Hygiene Plan
  2. Understand content of OSHA Hazard Communication CFR-29.1910-1200, CFR-29.1910.1450 found online <https://www.ecfr.gov/> Electronic Code of Federal Regulations
  3. Locate the potentially hazardous chemicals in the workplace by review of the Chemical Inventory List (**QRSAF- Chemical Inventory List**)
  4. Recognize the chemical labeling and its meaning.
  5. Be able to locate the SDS using JTDMH on-line SDS database. (**MSDS Source** on desktops)
  6. Locate the health hazard, physical hazard, environmental.

protection, and special protection sections in the SDS and explain their use

* 1. Identify their Laboratory Safety Officer by name and title. (Michele Homan)
  2. Identify the appropriate PPE for the area and discuss their use.
  3. Discuss emergency procedures in the event of a hazardous chemical spill.
  4. . Identify work practice controls.

1. **Ordering Considerations:**

JTDMH-New Vision Laboratories adheres to the small quantity approach for purchasing hazardous substances to ensure both laboratory economy and safety. Chemicals are to be purchased only in the quantities needed on a short-term basis. There are many reasons for concluding that "less is better":

* 1. Unused chemicals can constitute as much as 40% of the hazardous waste generated from laboratories.
  2. Smaller packages are emptied faster, reducing the chance for decomposition of reactive compounds.
  3. Breakage is substantially less in small package sizes.
  4. Risk of accident and exposure to the hazardous material is less when handling smaller containers.
  5. Storeroom space is reduced.

1. **Chemical Ordering and Tracking System**
   1. Persons ordering new chemicals (i.e. the chemical has not been used before) must request a safety data sheet from the vendor. A copy of the SDS sheet is to be sent to the Materials Management Director (Abe Kramer) at the hospital that maintains the on-line database for it to be scanned into the system.
   2. The SDS are available through **MSDS Source** on any desktop at JTDMH PC.
2. **Labeling System**

OSHA’S Hazard Communication Standard requires the use of GHS (Globally Harmonized System) labels for primary (manufacturer) chemical containers. Every label must contain the name, address and phone number of the chemical manufacturer, the chemical name, signal words to indicate the relative level of severity of the hazard, hazard statements to describe the nature of the hazard, precautionary statements to describe measures that should be taken to minimize or prevent adverse effects of exposure and pictograms. OSHA also requires that secondary or pour off chemical containers be properly labeled, but the use of GHS labeling is not required on secondary containers.

1. GJS Label – Example

Text

Description automatically generated

A picture containing calendar

Description automatically generated

1. A picture containing text, clipart, sign

   Description automatically generatedNFPA (National Fire Protection Association) label

**BLUE –** Health Ratings

**RED** - Flammability Ratings

**YELLOW** - Reactivity Ratings and

**WHITE** – **S**pecial information

In addition, a similarly colored vertical label, described as Hazardous Materials Identification System (HMIS) can be used.

1. Graphical user interface

   Description automatically generatedGraphical user interface

   Description automatically generated with medium confidence

**Hazard Ranking Description (NFPA/HMIS)**

**Health (BLUE)**

|  |  |  |
| --- | --- | --- |
| **Rating** | **Hazard** | **Meaning** |
| 0 | Minimal | No significant risk |
| 1 | Slight | Irritation or minor reversible injury possible |
| 2 | Moderate | Temporary or minor injury may occur |
| 3 | Serious | Major injury likely unless prompt action is taken and medical treatment is given. |
| 4 | Severe | Major life threatening or permanent damage may result from single or repeated exposures |

**Flammability (RED)**

|  |  |  |
| --- | --- | --- |
| **Rating** | **Hazard** | **Meaning** |
| 0 | Minimal | Materials which are normally stable and will not burn unless heated. |
| 1 | Slight | Materials that must be preheated before ignition will occur. Flammable liquids in this category will have  flash points (the lowest temperature at which ignition will occur) at or above 200◦F (NFPA Class 111B) |
| 2 | Moderate | Material which must be moderately heated before ignition will occur, including flammable liquids with  flash points at or above 100◦F and below 200◦F (NFPA Class 11 & Class 111A) |
| 3 | Serious | materials capable of ignition under almost all normal temperature conditions, including flammable liquids with flash points below 73◦F and boiling points above 100◦F as well as liquids with flash points between 73◦F and 100◦F (NFPA Classes IB and IC). |
| 4 | Severe | Very flammable gases or very volatile flammable |

REACTIVITY (YELLOW)

|  |  |  |
| --- | --- | --- |
| **Rating** | **Hazard** | **Meaning** |
| 0 | Minimal | Materials which are normally stable, even under fire conditions, and which will not react with water. |
| 1 | Slight | Materials which are normally stable, but can become unstable at high temperatures and pressures. These materials may react with water, but will not release energy violently. |
| 2 | Moderate | Materials which in themselves are normally unstable and will readily undergo violent chemical change, but will not detonate. These materials may also react violently with water. |
| 3 | Serious | Materials which are capable of detonation or explosive reaction, but require a strong initiating source, or must be heated under confinement before initiation, or materials which react explosively with water. |
| 4 | Severe | These materials are readily capable of detonation or explosive decomposition at normal temperatures and pressures. |

**C Labeling requirements include the following**

* 1. Do not remove or deface manufacturer's labels.
  2. Labels must contain the identity of the chemical and appropriate hazard warnings which usually include health, flammability, and reactivity information. Either the NFPA/ HMIS system or the GHS system is to be used.
  3. With NFPA, generally, compounds with ratings of 2 or greater for all categories are considered hazardous materials.
  4. If chemicals are removed from the manufacturer labeled container and will be used over a period of time, the secondary container will be labeled with the contents and hazard of the chemical in the container.
  5. It is not required to label portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee performing the transfer.

1. **GENERAL PRINCIPLES TO REDUCE EXPOSURE TO CHEMICALS** 
   1. It is prudent to minimize all chemical exposures. Because few laboratory chemicals can be used without any hazard, general precautions for handling all laboratory chemicals should be adopted, rather than specific guidelines for a particular chemical. Skin contact with chemicals should be avoided as a primary rule.
   2. Avoid underestimation of risk. Even for substances of no known significant hazard, exposure should be minimized. For work with substances which present special hazards, special precautions should be taken. One should assume that any mixture will be more toxic than its most toxic component and that all substances of unknown toxicity are toxic.
   3. Provide adequate ventilation. The best way to prevent exposure to airborne substances is to prevent their escape into the working atmosphere by use of hoods and other ventilation devices.
   4. Institute a Chemical Hygiene Program. The chemical hygiene program designed to minimize exposures is mandatory; it is a regular, continuing effort, not merely a standby or short-term activity.
   5. Observe the PELs, TLVs. The Permissible Exposure Limits of OSHA and the Threshold Limit Values of the American Conference of Governmental Industrial Hygienists should not be exceeded.
   6. Rules for Safe Handling and Use of Chemicals:
2. Do not smell or taste chemicals. Apparatus that can discharge toxic chemicals (vacuum pump) should be vented into local exhaust devices.
3. Inspect gloves to ensure that they are not ripped nor have holes.
4. Eating, drinking, smoking, vaping, gum chewing or applying cosmetics or lip balm in areas where laboratory chemicals are present is prohibited.
5. Wash hands before leaving the laboratory.
6. Storing, handling or consuming of food or beverages in storage areas, refrigerators or freezers that are also used for laboratory operation is prohibited.
7. Do not use glassware or utensils that are also used for laboratory operations.
8. Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware
9. Use equipment only for its designated purpose.
10. Avoid practical jokes or other behavior that might confuse, startle or distract another co-worker.
11. Mouth-pipetting is prohibited for any substance. Pipetting devices are readily available in all sections.
12. Confine long hair and loose clothing; men with beards should keep them trimmed to avoid possible danger near any instrumentation.
13. Wear shoes at all times in the laboratory. Do not wear sandals, perforated shoes, open toe shoes or any shoes made of canvas.
14. Keep the work area clean and uncluttered, with chemicals and equipment properly labeled and stored.
15. Water should never be poured into acid.
16. Ensure that the appropriate eye protection, where necessary is worn in areas where chemicals are handled.
17. Eyewash stations are available in areas where hazardous chemicals are used. Safety showers are inspected periodically by each hospital’s Maintenance Department. Records are maintained by the Maintenance Department
18. A Laboratory Safety Audit is conducted annually.
19. Fire extinguishers are to be inspected monthly by each hospital’s Maintenance Department. Review is documented on the tag connected to the extinguisher.
20. Staff wearing contact lenses are advised to wear eye protection due to increased potential of eye injury with hazardous chemical exposure. Do not remove or insert contact lenses in the laboratory.
21. Wear appropriate gloves when the potential for contact with toxic materials exist.
22. Use personal protective equipment as appropriate.
23. Heavy containers should be stored on lower shelves.
24. Remove laboratory coats immediately upon significant contamination and when leaving the laboratory.
25. JTDMH does not current use a fume hood. Our Biosafety hood is not a fume hood and should not be used as one as it is not vented to the outside.
26. **SPILLS AND ACCIDENTS**

**Note: For spills of serious and acute nature, and/or for large spills, implement the Code Orange emergency procedure. (Dial x2222)**

Liquid spills should be generally handled as follows using the **C.L.E.A.N.** concept:

**C**ontain the spill, if possible.

**L**eave the area, if necessary.

**E**mergency: utilize available eye wash stations and/or safety shower and seek medical care.

**A**ccess SDS, for information.

**N**otify a supervisor.

11.1 **Spills And Accidents: (significant amount = 1 gallon or greater):**

* + 1. DO NOT call housekeeping for hazardous material (chemical) spills. They are only trained for chemotherapy and mercury spill response only.
    2. In the event of a chemical spill, contain spill immediately using the chemical spill kit to contain the spill. Lab coats, gloves and if necessary, aprons should be worn. (On top of Flammable cabinet in Histology)
    3. Evacuate area and close doors.
    4. Obtain the SDS (Safety Data Sheet) for the chemical spilled access the MSDS ON-LINE through the internet. If respiratory component, contact Maintenance to shut down ventilation to the area.
    5. If dangers of adverse physical effects exist from inhalation remain evacuated from the affected lab area and if possible, report STAT tests from non-affected areas.
    6. Notify Plant Operations or Nursing Supervisor (for after hours)
    7. Complete an incident report and send to lab manager.
    8. Do not return to spill area until the Fire Department or on scene authority has given clearance.

If personal items of clothing are contaminated, they must be left at the hospital and laundered at the hospital’s expense.

1. **Chemical Spills (less than 1 gallon)**
   1. Contain the liquid either with the spill kit or absorbent material.
   2. Obtain the SDS for the chemical spilled access the SDS ON-LINE through the internet
   3. Dispose of the material appropriately according to the SDS
   4. Submit an incident report to the lab manager.
2. **SPECIAL HANDLING PROCEDURES FOR HAZARDOUS CHEMICALS**

Moderate Chronic or High Acute Toxicity (Hazards)

* 1. Minimize exposure to these toxic substances by any route using all reasonable precautions. Use personal protection: Always avoid skin contact by use of gloves and impermeable laboratory coats (and other protective apparel as appropriate). Always wash hands and arms immediately after working with these materials

1. **EQUIPMENT and PERSONAL PROTECTIVE EQUIPMENT (PPE)**
   1. **Equipment**

A.

* 1. All **Biosafety Hoods** are inspected annually and certified by an outside agency. JTDMH lab does not have a current fume hood. Any hood not passing inspection is taken out of service immediately and not used until the hood has passed inspection. It is the responsibility of the employer to purchase the parts and to replace the unit in a timely fashion so as not to endanger the health and well-being of an employee or place the facility at risk.
  2. **Eyewash stations** are located no greater than 10 seconds travel distance from areas where hazardous chemicals are used. Manufacturer’s specifications are available and eyewash stations meet the requirements to provide emergency rinsing of the eyes and facial area in the event of a chemical or particulate exposure. The eyewash station includes the following:
     1. Capable of delivering 1.5L per minute for 15 minutes
     2. Flow is provided to both eyes simultaneously.
     3. Nozzles or covers to protect from airborne contaminants.
     4. Hands-free flow once activated.
     5. Signage for location of eyewash
     6. Unobstructed path to the eyewash
     7. Tepid fluid temperature (Water temperature between 15 and 37 C)
     8. Plumbed systems are protected from unauthorized shut off
     9. Plumbed eyewash stations are activated weekly and checked for proper operation. These records are maintained either by laboratory staff or the Maintenance Department of the facility.
  3. **Safety showers** are inspected periodically by each hospital’s Maintenance Department. Records are maintained by the Maintenance Department.
  4. **Fire extinguishers** are inspected monthly by each hospital’s Maintenance Department. Review is documented on the tag connected to the extinguisher.

1. **Personal Protective Equipment**
   1. Employees are required to wear gloves when the employee has the potential for direct skin contact with blood, hazardous chemicals, and infectious materials.
   2. Masks, eye protection, gloves or chin-length face shields are worn to prevent splashes or sprays of blood, infectious materials, or hazardous chemicals if there is a potential for hand, eye, nose, or mouth contamination.
   3. Impermeable laboratory coats, provided by the Department, are to be worn only in the laboratory area and are to be closed to protect the employee's clothing when occupational exposure to blood and other potentially infectious material is possible.
   4. All personal protective equipment is removed immediately upon leaving the work area (or as soon as possible). Disposable lab coats should be discarded when visibly contaminated. Laboratories that launder lab coats will provide the laundry service.

**STORAGE OF CHEMICALS**

1. **Flammable Liquids** (see **Quick Reference QRSAF Lab Flammable Cabinet**)
   1. Flammable liquids should be stored, whenever possible, in storage cabinets specifically designed for the storage of these types of materials.
   2. Flammable liquids kept outside of appropriate storage cabinets, in quantities greater than 1 liter, should be stored in metal safety cans.
   3. Flammable liquids in unprotected glass or plastic containers should be limited to one gallon per l00 square feet of laboratory area.
2. **Acids (Sulfuric, Acetic, Hydrochloric**) (see **Quick Reference QRSAF Lab Acid Cabinet List**)
   * 1. Always store acids below eye level. Store near the floor.
     2. Do not store acids under sinks, where contamination by moisture may occur.
     3. Do not store acids near bases. Acids and bases should be adequately separated to prevent a chemical reaction in the event of an accident/spill/leak.
     4. Always **add ACID TO WATER** when preparing a diluted acid solution. Allow ACID to run down the side of the container and mix slowly by gentle rotation.
3. **Bases (Ammonium Hydroxide, Potassium Hydroxide, Sodium Hydroxide**)
   * 1. Always store bases below eye level. Store near the floor.
     2. Do not store bases under sinks, where contamination by moisture may occur.
   1. Do not store strong bases in the same cabinet with strong acids. Acids and bases should be adequately separated to prevent a chemical reaction in the event of an accident/spill/leak.
4. Carcinogens or suspect carcinogens must be stored in a secure area and clearly marked "CARCINOGEN" or "SUSPECT CARCINOGEN".
5. **DISPOSAL OF HAZARDOUS/NON-HAZARDOUS CHEMICALS**
   1. Waste from Laboratory analyzers are disposed of according to the instrument manufacturer’s recommendations. Most chemical reagents on analyzers are used in small amounts and are diluted with water as the instrument performs rinses so are safe to be flushed down the drain.

19.2. Wastes that cannot be disposed in regular waste are disposed of by a hazardous waste disposal contractor in compliance with OSHA regulations. Arrange with the Director of Materials Management for the safe disposal of any chemical wastes when the appropriate disposal route is not known. (See **Waste Disposal Quick Reference**)

19.3. FORMALDEHYDE/FORMALIN

* + 1. There should be no disposal of formalin in our lab at JTDMH. All Biopsy containers are sent to NVML in Lima for processing. Any spills should be cleaned up and disposed according to local and state regulations. Bagged waste spills should be taken to Materials to be properly disposed of by Hazardous waste vendor.

1. **Medical Program**

**First Aid**

* 1. **Eye contact**: promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention immediately.
  2. **Ingestion**: encourage the victim to drink large amounts of water. Seek medical attention immediately as noted above.
  3. **Skin contact**: promptly flush the affected area with water and remove any contaminated clothing; use a safety shower when contact is extensive.
     + 1. **CONCENTRATED ACIDS OR BASES**: Remove contaminated clothing immediately and get into safety shower/sink with excess flowing water. Seek medical attention immediately.
  4. Identify the chemical.
  5. Refer to the SDS sheet and follow any additional instructions.
  6. Call ED if needed for help **x3518**, Occ Health **x2177**
  7. Call Poison Control Center, if necessary **(1.800.222.1222**)
  8. Escort the exposed person to the Emergency Department.
  9. If a spill represents a hazard to other building occupants, follow guidelines for the emergency **Code Orange. (x2222**)
  10. All incidents or near misses are to be reported to the area supervisor immediately and reported in the on-line incident reporting system. **RISK RL**

1. **Medical Consultation**
   1. All employees needing medical attention use seek attention in the Emergency Department.
   2. All medical examinations and consultations are performed by or under the direct supervision of a licensed physician without cost to the employee, without loss of pay, and at a reasonable time and place. A physician experienced in occupational medicine is used whenever possible.
      1. The employee is sent for, or offered, medical evaluation:

a. Whenever signs and symptoms associated with a hazardous chemical develop.

b. When environmental monitoring reveals an exposure level routinely above the action level.

c. Whenever an event takes place in the work area such as a spill, leak, or explosion resulting in hazardous chemical exposure.

* + 1. 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).

c. A description of the signs and symptoms of exposure.

d. A copy of the SDS for the chemical(s) involved.

* + 1. The physician provides a written opinion that will include:
    2. Any recommendation for further medical follow-up.
    3. Results of the medical examination and any associated tests.
    4. Any medical conditions that may be revealed during the examination that may place the employee at increased risk as a result of exposure to a hazardous chemical found in the workplace.
    5. 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.
    6. Employee medical records will be maintained in the Employee Health Services. Employee medical records are kept in accordance with 29 CFR 1910.20, which is length of employment plus thirty years. Copies of the physician's written opinion will be provided for the employee's personnel file.

1. **Exposure Evaluations and Monitoring**
   1. A. Exposure Evaluations
   2. An exposure evaluation will be conducted for employees who, because of a laboratory operation, procedure or activity, reasonably suspect or believe they have sustained an overexposure to a toxic substance. The exposure evaluation shall be initiated by Employee Health Services. It is the employee's responsibility to report the exposure incident immediately to their immediate supervisor for evaluation.
2. Environmental Monitoring
   1. Air monitoring of select laboratory areas for formalin will be provided by the Hospital approved vendor if conditions exist where staff are concerned of prolong exposure. We have very little use currently and <30 min per day of any formalin activity.
3. **Record Keeping**

The laboratory maintains records in accordance with 29 CFR 1910.20.

1. The following records are maintained by the Laboratory.
   1. Inventory of acutely hazardous substances.
   2. Environmental monitoring.
   3. Laboratory safety audits.
   4. Training documentation and attendance.
   5. Annual review of the Chemical Hygiene Plan.
2. Employee Health Services maintains employee medical records.
3. Accident records are retained by:
   1. Incident Reporting Software
   2. Risk Management
   3. Disability Management

# REFERENCES

1. OSHA 29 CFR Part 1910.1200
2. OSHA 29 CFR Part 1910.1020
3. OSHA 29 CFR Part 1910.1450
4. CAP GEN. 73500, 74400, 76000...76700
5. “Safety First with Chemical Handling and Labeling”, CLN, February 2017

ANNUAL REVIEW

* Annual review for 2022 complete. No chemical spills or incidents reported.
* Annual review for 2023 complete. No chemical spills or incidents reported. Safety review completed and discussed in quarterly review and monthly meetings.

Revision of updates; Approved

Medical Director

Patrick Feasel, MD

Date \_\_\_\_\_5.8.24\_\_\_\_\_\_

Lab Manager

Thomas Geis, MT(ASCP)

Date: 5.7.24