

**VA NORTHEAST OHIO HEALTHCARE SYSTEM  
Louis Stokes Cleveland DVAMC  
Medical Research Service**

**2023 MEDICAL RESEARCH SERVICE  
SAFETY TRAINING MANUAL**

**Containing all aspects of the**

**CHEMICAL HYGIENE PLAN**

**HAZARD COMMUNICATION PROGRAM**

**&**

**HAZARDOUS AGENTS CONTROL PROGRAM**

**Effective Date:** July 12, 2023

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**THE LOUIS STOKES CLEVELAND VETERAN'S AFFAIRS  
MEDICAL CENTER**

**10701 EAST BLVD  
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## TABLE OF CONTENTS

<u>Page #s.</u>	<u>Subject</u>
25	Accident Procedure
4	Chemical Hygiene Officer
16 – 17	Chemical Hygiene Responsibility
7	Chemical Inventory
7 – 8	Chemical Labeling
11 – 12	Chemical Storage
12 – 13	Compressed Gas Handling
19	Contractors
26	Electrical Safety
22	Emergency Eyewash Stations/Emergency Showers
19 – 21	Emergency Procedures
19 – 20	a) Disaster and Disaster Drill Procedure
20 – 21	b) Fire and Fire Drill Procedure
20 – 21	c) Fire-alarm pulls boxes
21	d) Fire Extinguishers
21	e) Emergency Overhead Paging Codes
22 – 24	Engineering Controls
22	a) Bottle Carriers
22	b) Cold rooms
26	c) Electrical Outages
23	d) Fume hoods
23 – 24	e) Housekeeping
24	f) Laundry Service
24	g) Lipped shelves
24	h) Work orders
13 – 15	Hazardous Chemical Handling
13 – 14	a) General Precautions
14	b) Allergens and Embryotoxins
14	c) Moderate, Chronic, or Acute Toxicity Chemicals
14 – 15	d) High Chronic Toxicity Chemicals
15	e) Cancer Causing Agents
15	f) Formaldehyde
17	Hazardous Waste & Chemical Disposal
9 – 11	Hazardous Material Spill Procedure
26	Immunizations
4-5	Laboratory Security (Hazardous Materials)
6	Laser Safety
25	Lock-out/Tag-out
8 – 9	SAFETY DATA SHEET - SDS
25 - 26	Medical Requests
19	Monitoring of Vapor Forming Chemicals
16	Occupational Health and Safety Regulations
17 – 19	Personal Protective Equipment
17	a) Protective clothing
18	b) Gloves
18	c) Eye protections
18	e) Hearing (Noise) Protection
19	d) Respiratory protections

27	Physical Hazards
6	Radiation Safety Training
4	Research Safety Coordinator
4 – 5	Security, Laboratory (Hazardous Materials)
4	Security Awareness
16	Subcommittee on Research Safety and Security (SRSS), Medical Research Service
6	Safety Notebook (MAXCOM)
23 – 24	Sharp Material Disposal/Storage
23	a) Non-Infectious Sharp Material Disposal
23 – 24	b) Infectious Sharp Material Disposal
26	Smoking
5 – 6	Training

### **Medical Research Service Safety Policies:**

Policies can be found at: <https://www.clevelandvaresearch.org/srs-policies>

- SRS-001 – Safety Program
- SRS-002 – Biosafety Policy
- SRS-003 – Storage Procedures for Common Storage Areas
- SRS-004 – Laboratory Moving
- SRS-005 – Laboratory Decommissioning
- SRS-006 – Utility Failure Procedures
- SRS-007 – Eating and Drinking
- SRS-008 – Office Safety
- SRS-009 – Infection Control Procedures for the Animal Research Facility
- SRS-010 – Employee Training by Supervisor
- SRS-011 – New Employee Training
- SRS-012 – Fire and Fire Drill Procedure
- SRS-013 – Risk Assessment Policy
- SRS-014 – Emergency Protocol for the Animal Research Facility
- SRS-015 – Research Protocol Safety Survey (VA Form 10-0398)
- SRS-016 – Controlled Substance Program: Medical Research
- SRS-018 – Inventory Control of VA Equipment
- SRS-019 – Emergency Preparedness
- SRS-020 – Access to Medical Research Space
- SRS-021 – Ordering of Select Agents or Hazardous Chemicals
- SRS-024 – Infection Control Procedures for Infectious Diseases Research
- SRS-025 – Institutional Review Entity
- SRS-027 – Infection Control Procedures for Work Involving SARS-CoV-2

## **INTRODUCTION:**

The Medical Research Service Safety Training Manual complies with the Occupational Safety and Health Administration (OSHA) standards entitled "Occupational Exposures to Hazardous Chemicals in Laboratories" (29 CFR 1910.1450) and "Hazardous Communication" (29 CFR 1910.1200). Other OSHA standards are cited under Occupational Health and Safety Regulations (page 7). Employees must use this manual as a reference for policies and practices at this work site. It contains research safety policies/procedures to follow when handling hazardous materials and information derived from the Right-to-Know law (page 9). The Research Safety Coordinator/Chemical Hygiene Officer (RSC/CHO) works with the Medical Research Service Subcommittee on Research Safety to institute new policies, revise existing policies, and train employees in safe work practices.

# RESEARCH SAFETY COORDINATOR/CHEMICAL HYGIENE OFFICER

John Schaffer is the RSC/CHO for Medical Research Service. He can be reached at (216) 791-3800 extension 64263, in the Research Office (K-117) or by e-mail at [john.schaffer@va.gov](mailto:john.schaffer@va.gov)

The RSC/CHO is responsible for:

1. Developing, administering, and updating safety program policies for Medical Research Service.
2. Ensuring the security of Medical Research Service laboratories.
3. Conducting, documenting, and updating in-service training for laboratory personnel annually, including auditing every laboratory investigator's research program.
4. Processing new chemical requests for Medical Research.
5. Preparing agendas/minutes for the Subcommittee on Research Safety and Security (SRSS).
6. Reporting minutes from the Institutional Biosafety Committee (IBC) of record when a VA-related study is discussed.
7. Ensuring weekly inspections of the emergency eyewash/shower stations are conducted.
8. Maintaining documentation and reporting of semi-annual laboratory (health and safety) inspections from onsite and offsite locations, where VA-approved research is conducted.
9. Coordinating and reporting semi-annual chemical inventory updates for Medical Research Service with the Facility Safety Office.
10. Coordinating and reporting semi-annual reviews of laboratories working with select agents.
11. Coordinating and reporting semi-annual research security system activity.
12. Presenting annual Physical Security Assessments at a convened SRSS meeting.
13. Conducting and reporting safety and security drills (e.g., fire, chemical or biological spill, biothreat, active shooter, or emergency preparedness) on an annual basis.
14. Reporting and maintaining documentation of Annual Workplace Evaluations (AWE), Environment of Care (EOC) rounds, Police Security Vulnerability Reports, and Semiannual Reviews of the Animal Research Facility (ARF).
15. Preparing an Annual Research Safety Summary report for the Research and Development Committee and the Medical Center Director. The following must be reported: Drills conducted, reports of spills, accidents, and injuries; AWE findings; EOC findings; Police Security Vulnerability Reports; all semi-annual reviews (hazardous chemicals, physical security, select agents, and laboratory inspections (onsite and offsite).
16. Coordinating the semi-annual reporting of all hazards in Medical Research to Personnel Health.

## HAZARDOUS MATERIALS: LABORATORY SECURITY

All laboratories must have doors. Laboratories that house hazardous materials (radioactive, biological, chemical, and select agents) ***must*** always be secured, i.e., occupied and/or laboratory door closed (all laboratory doors lock upon closure and have non-defeating lock mechanisms). All points of entry into laboratory space where hazardous materials are in use and/or stored shall have automatic-closing devices, as mandated by the National Fire Protection Association, NFPA 101, 19.3.2.1.3. This standard of security is mandated by Medical Research Service, VHA Handbook 1200.06: Control of Hazardous Agents in VA Research Laboratories, the Nuclear Regulatory Commission, the Department of Veterans Affairs National Health Physics Program, and Congress.

**Security Awareness:** Employees will utilize the Emergency Paging Code System (page 22) when a suspicious person, package (LSCDVAMC Biological and Chemical Terrorism Response), or violent behavior is noticed. Strangers/personnel without Identification Badges are to be challenged.

**Laboratory Security** – Corridors accessing laboratories in Medical Research Service are always secured. The following security mechanisms are in place:

1. **Key Access:** New employees receive keys to the laboratory that they will be working in. Keys are not issued to an employee until all safety training and personnel paperwork have been initially completed and updated annually thereafter. Until the necessary paperwork has been completed, access to laboratory space will be denied. Employees must sign a key logbook when issued a key.

Medical Center Policy 138-001 Space Key Control is provided to all new employees.

2. **Proximity Readers/Cards:** Proximity Cards are issued with the same requirements as noted in Key Access. Proximity Readers are located at points of entry to laboratory space and the elevator in Medical Research. Access can be removed from a Proximity Card if training and/or Without Compensation (WOC) appointment paperwork is not up to date.

Employees obtain Proximity Cards in the PIV (Personal Identification Verification) Office, which is part of Police Service. Contact the PIV Office at extension 4609 or 4610 if you have any questions. Proximity Readers are linked to software that record the date and time an employee enters a secured area. The software records denied entries and exits made without utilizing the Proximity Reader. For employee safety, at each point of egress, a green “exit” button will disengage the magnetic locking device that secures the door; this prevents an employee from being trapped in the facility in the event of an emergency.

3. **Cameras:** Cameras are positioned throughout Medical Research to monitor/record 24/7 activity at eleven points of access into laboratory space. Camera activity is displayed on remote surveillance screens located in Police Service.
4. **Select Agents and Radioactive Materials:** Select agents and radioactive materials must be stored in a locked cupboard, refrigerator, or freezer. Exempt quantities of toxins and hazardous agents/chemicals must be controlled when not in use or not in direct view of an unapproved individual. Laboratories that house select agents are keyed-off the grand master key system, which indicates that only one key opens such laboratories. Keys to these laboratories are issued to specific laboratory personnel and Police Service only.
5. **Visitor Log-Book:** Visitors to Medical Research Service must sign a Visitor Log-Book located in the Research Office, room K-115. An employee must accompany all visitors from the laboratory that they are visiting. Visitors are not permitted to enter a secured area without an escort. Employees are directed to instruct all visitors to report to the Research Office and sign the Visitor Log-Book.

## TRAINING

All annual training records are documented and maintained.

1. **Formaldehyde Training** – OSHA regulation 29 CFR 1910.1048 requires annual training in the hazards of formaldehyde for persons working with formaldehyde gas, all mixtures or solutions composed of greater than 0.1% formaldehyde, and/or materials capable of releasing formaldehyde into the air. The Facility Safety Office assigns formaldehyde training in the Talent Management System (TMS), which covers the Medical Center’s Formaldehyde policy, OOS-027.

Medical Research Services also requires annual Formaldehyde Safety Training for those working with a formaldehyde-based solution, i.e., 1%, 10%, 37%, or 100% formaldehyde, formamide, formalin, etc.

2. **Environment of Care Safety Training** – General Medical Center safety rules are presented in the VA Talent Management System (TMS), which comprises the Joint Commission on Accreditation of Healthcare Organization (JCAHO) Safety Training. All new VA and non-VA employees who work at the VA Medical Center (on-site or leased facility) must complete this training when hired and annually thereafter. Subjects include:
  - a. **Emergency Management Planning Training** – All employees will be familiar with how to identify an emergency, assess the level of risk, the phases of emergency management, and the emergency plans that are in place through a module in TMS.
  - b. **VAMC Fire Protection and Prevention Training** – All employees will be familiar with how to prevent a fire and what to do if there is a fire through a module in TMS.
  - c. **Infection Prevention Training** – All employees will be familiar with the chain of infection, Occupational Safety and Health Administration (OSHA) – bloodborne pathogens, infectious waste management, tuberculosis, isolation precautions review, environmental cleaning and reusable medical equipment, influenza and other vaccine preventable diseases, Joint Commission National Safety Goals, resistant organisms, Legionella disease, construction, emerging pathogens, and emergency management/bioterrorism through a module in TMS.
  - d. **MAXCOM Global Harmonization Training** – All employees will be familiar with the MAXCOM system, including signal words, hazard classifications, pictograms, hazard statements, and precautionary statements through a module in TMS.
  - e. **Practicing Safety at Work Training** – All employees will be familiar with the Medical Center’s smoking restrictions, personal protective equipment and what is used and when, electricity safety, preventing back injuries, ergonomics awareness, slips, trips, and falls, MRI safety, reporting injuries at work, and employee rights through a module in TMS.
  - f. **Active Shooter Training** - All employees will learn of their options and how to respond to an Active Threat Event in progress through a module in TMS.
3. **Laboratory-Specific Safety** – The laboratory supervisor/investigator must present and document laboratory-specific safety training to an employee upon the latter’s initial assignment to the laboratory and annually thereafter. Additional training *is required* every time a new chemical, piece of equipment, protocol or protocol modification is introduced into the employee's duties. Laboratory-specific training covers the chemicals, equipment, and procedures that the employee will utilize. Emphasis must be placed on relevant hazards, ways to detect a chemical release, storage and handling protocols, personal protective equipment, and emergency procedures.

More specific information concerning the content of this training can be found in SRSS Policy -10, Employee Training by Supervisor Policy.

Additionally, a Risk Assessment and Certification form is completed for each lab, updated as needed, and reviewed on an annual basis. This assessment covers chemical, biological, and

physical (equipment) hazards. The initial risk assessment as well as the addition of risks must also be reviewed by an Industrial Hygienist from the Facility Safety Office.

The laboratory investigator's research program (i.e., personnel on studies and their training records, hazards (chemical, biological, physical, and radiation), risk assessments, and lab inspection reports and findings) will be audited annually by the RSC/CHO.

4. **Medical Research In-Service** – Service-specific rules on safety are presented by the RSC/CHO at the Medical Research In-Service. Training covers the Chemical Hygiene Plan, the Right-to-Know Law, the Hazard Communication Program, and safety policies and procedures that affect research employees. *No employee may handle or work in the vicinity of any hazardous material until he/she completes all safety training.* This in-service training is required at start of hire and annually thereafter.
5. **Radiation Safety Training** – Any employee who works with or around radioactive material or x-ray equipment must attend an orientation from the Radiation Safety Officer (RSO) and complete annual radiation safety training, which is provided by the RSO/Chief of Staff, (216) 791-3800 extension 63096. Instructions to workers regarding radiation safety are posted in all laboratories that house radioactive material(s).
6. **Laser Safety Training** – Employees who operate or work within the same room where equipment that function with the use of a laser (specifically class 3b or 4) must complete Laser Safety Training provided by the Laser Safety Officer, (216) 791-3800 extension 63096.
7. **Department of Transportation Training** – Current U.S. Department of Transportation (DOT) regulations require initial and recurrent training of all employees who perform work functions covered by the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Any employee whose work directly affects hazardous materials transportation safety is required to have training.
8. **Enhanced BSL-2+ Safety Training** – Employees who work with samples that are confirmed or potentially contain SARS-CoV-2 are required to annually take this training.
9. **Powered Air-Purifying Respirator (PAPR) Training** – Employees who work with samples that are confirmed or potentially contain SARS-CoV-2 are required to take this training.

## MAXCOM

MAXCOM is a web-based workplace chemical safety program that fully complies with the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard [29CFR 1910-1200]. OSHA requires that employers identify hazardous chemicals in the workplace and effectively communicate these hazards to employees.

## MAXCOM SAFETY NOTEBOOK

Every laboratory must have a MAXCOM SAFETY notebook. This notebook contains:

1. Medical Center Policy OOS-006 Hazard Communication Plan.
2. A Chemical Inventory specific for the laboratory (by room number).
3. Safe Use Guides.
4. The most recent Medical Research Service Safety Training Manual.



## 5. Laboratory-specific Standard Operations Procedures (SOPs).

The RSC/CHO will provide updated information to each laboratory to add to or replace existing documents in the MAXCOM Safety Notebook.

## MAXCOM CHEMICAL INVENTORY

Laboratory chemical inventories includes all OSHA and EPA deemed hazardous chemicals. Lab-specific chemical inventories are located in each laboratory's MAXCOM Safety Notebook and in MAXCOM.

Chemical inventories are updated in real-time, i.e., purchases of new chemicals are uploaded into MAXCOM upon approval from the Facility Safety Office and when chemicals are removed from a laboratory's inventory (upon completion of a chemical or when disposed of through a Hazardous Chemical Pick-up as noted on page 9). This information is provided to the RSC and is then forwarded to the Facility Safety Office, which maintains all chemical inventories in the MAXCOM program. Inventories of chemicals on hand are reviewed semi-annually by the RSC. Since every chemical must be inventoried, maintaining the minimum number of chemicals on hand is advisable.

Authorized Users of radioactive material (RAM) are required to complete semi-annual inventories per the Radiation Safety Officer. Radioactive materials must not be included with the chemical inventory.

## CHEMICAL LABELING (ORIGINAL & SECONDARY)

**\*\* YOU HAVE THE RIGHT-TO-KNOW ABOUT ANY HAZARDOUS MATERIAL YOU USE \*\***

*Never underestimate the risks involved with chemical work*

The Hazard Communication Law requires that all chemicals in the laboratory have a complete label, even those chemicals manufactured before the law went into effect. This labeling requirement applies to all chemicals, in original or secondary/other containers. A MAXCOM label must be affixed to all secondary containers. This label includes the chemical's common name, a National Fire Protection Association safety diamond (as described below), the hazards associated with the chemical, and the personal protective equipment required for safe handling and to eliminate exposure.

**Red - FLAMMABLE**

**Blue – HEALTH**

**Yellow – REACTIVITY**

**White – SPECIFIC HAZARDS,  
i.e., Corrosive, Oxidizer, etc.**

**Numeric NFPA Values:**

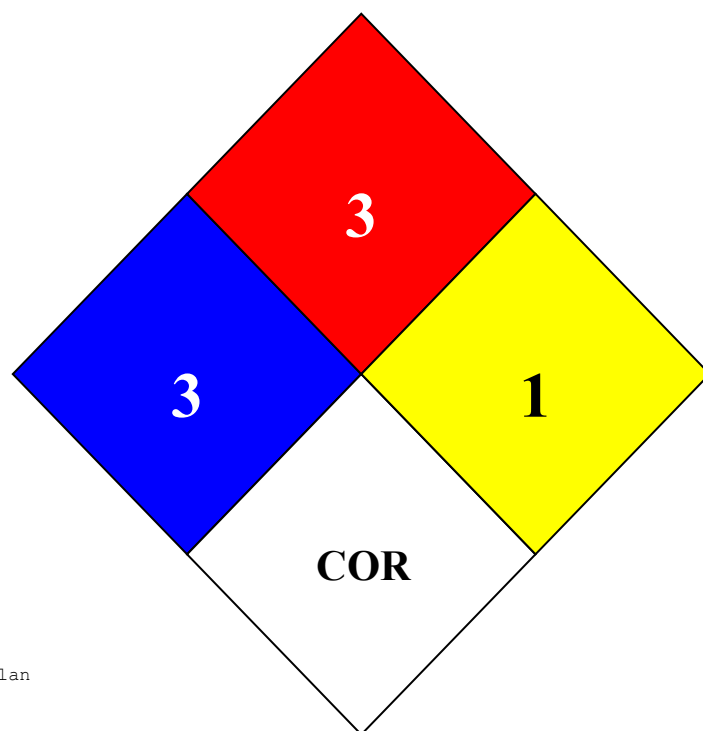
0 – NO HAZARD

1 – CAUTION

2 – WARNING

3 – DANGER

4 – EXTREMELY DANGEROUS



Employees must inspect chemical labels to determine if all required information is sufficient and legible. Labels on new/existing chemicals must never be removed or defaced. Illegible or insufficient labeling must be replaced or updated. The labeling law applies to all containers (*including* waste receptacles) and laboratory doors, i.e., Carcinogens, Biohazardous Material, and Radioactive Materials. Warning labels must also be posted at areas within the lab where special or unusual hazards exist.

**The Globally Harmonized System (GHS) Pictograms** – GHS Pictograms are a visual system that conveys information about dangerous chemicals. Pictograms are also referred to as hazmat symbols. This is helpful in facilities where employees speak different languages.



Precautionary information may appear on the original chemical label, such as:

- Recommended Personal Protective Equipment (PPE).
- Proper handling techniques.
- Proper storage.
- First aid procedures.

Older chemicals may have inadequate labels because they were manufactured prior to this law. To properly label a chemical, print a label from the MaxCom database.

If the chemical is no longer needed, see HAZARDOUS WASTE & CHEMICAL DISPOSAL. Do not remove or deface labels on chemical containers until *completely* empty and free of residual chemicals (rinsed with

water three times).

## **LABORATORY ENTRANCES: Chemical Use**

**The following chemical safety labels are affixed at laboratory entrances:**

1. **Danger: Flammable Gas** – When natural gas is used on a regular basis, e.g., Bunsen Burners.
2. **Formaldehyde in Use** – When Formaldehyde and/or a formaldehyde-based chemical is stored or used on a regular basis. This includes *any* percentage of formaldehyde (1% to 100% concentration), formalin, formamide, etc.
3. **Sensitizers in Use** – When a chemical causes an allergic reaction in normal tissue after repeated exposure, which is also called “chemical hypersensitivity”.
4. **National Fire Protection Agency Safety Diamond** – When any chemical rated by the National Fire Protection Agency (as noted above) is stored within a laboratory.

## **SAFETY DATA SHEET (SDS)**

The Hazard Communication Law requires that every hazardous chemical have an SDS that identifies vital information. The SDS is provided by the manufacturer and must be submitted to the RSC with each initial chemical order, which must be approved by the Facility Safety Office. When approved, the SDS will be downloaded into MAXCOM, which is located on the Louis Stokes Cleveland DVAMC Home Page.

**ALWAYS READ THE SDS BEFORE USING ANY CHEMICAL FOR THE FIRST TIME.**

**REVIEW CHEMICAL SAFETY HAZARDS AND PRECAUTIONS OFTEN.**

**Each SDS contains the following information:**

**Section I. – GENERAL INFORMATION:** States the identity of the material and the manufacturer.

**Section II. – HAZARDOUS INGREDIENTS:** Lists all hazardous chemicals that comprise 1% or greater of the chemical's composition. (Carcinogens are listed if their concentrations are 0.1% or greater.)

**Section III – PHYSICAL AND CHEMICAL CHARACTERISTICS:** Describes appearance, odor, boiling and melting points, specific gravity, etc.

**Section IV – PHYSICAL HAZARDS:** Describes fire and explosion hazard data, including toxic gases produced when burning. This includes:

**FLASHPOINT** – the lowest temperature at which a flammable liquid will form a vapor that can be ignited and burn.

**FLAMMABLE (EXPLOSIVE) LIMITS** – These are the lowest and highest levels of

flammable vapors that will ignite and burn.

**Section V – REACTIVITY DATA:** Describes stability. If unstable, it will list the conditions to be avoided. Incompatible chemicals and decomposition products are also listed.

**Section VI – HEALTH HAZARD DATA:** Lists information about health consequences, including routes of entry and target organs.

This section also lists symptoms and effects indicative of overexposure. FIRST-AID recommendations are listed. Exposure limits are defined as:

OSHA PEL – Permissible Exposure Limit: The maximum concentration of a chemical to which a worker may be exposed at any given time without known health consequences.

ACGIH TLV – Threshold Limit Value: The maximum concentration of contaminants to which workers may be exposed for an eight-hour workday without known health consequences.

**Section VII – STORAGE, SPILL AND DISPOSAL PROCEDURES:** Lists storage precautions and instructions for proper cleanup and disposal.

**Section VIII – PROTECTIVE EQUIPMENT:** Provides the manufacturer's recommendations for respirators, eye protection, gloves, and other personal protective equipment and ventilation.

## HAZARDOUS MATERIAL SPILL PROCEDURE

Medical Research employees are trained to be familiar with the *proper procedure* to follow in the event of a hazardous material spill, outlined in Medical Center Policy OOS-012 Control of Small Hazardous Material Spills. Carpeting/rugs/cloth seating are not permitted in laboratories/clinical areas where chemical or biological materials are handled. All surfaces must be easy to decontaminate after a hazardous material spill, i.e., linoleum, tiled flooring, etc. The following list indicates various hazardous materials and the service that should be contacted in the event of a spill or release:

### 1. Mercury:

- a. Environmental Management Service (E.M.S.), extension 4270. *Only* E.M.S. personnel are service-trained to safely clean a mercury spill; this is performed with a Mercury Vacuum that collects the mercury in a sealed container and is turned over to the Facility Safety Office for hazardous material pick-up.
- b. The RSC/CHO, extension 64263, provides a **Spill/Release Incident Report** form to be filled out by the employee(s) involved, is filed with the RSC/CHO, and submitted to the Facility Safety Office.

### 2. Radioactive Material:

Medical Research employees who cause or are otherwise affected by a radioactive material spill must respond in accordance with Medical Center Policy 000-028, Radioactive Material Acquisition and Control. In the event of a radioactive material spill, you must immediately contact the Radiation Safety Officer at extension 63096 or via cell phone 216-217-6506. You may also contact the Medical Health Physicist/Radiation Safety at 65428. A Radiation Emergency Response guidance sheet is posted in all laboratories that house radioactive material(s).

### 3. Hazardous Chemicals:

Medical Center Policy OOS-012 Control of Small Hazardous Material Spills outlines emergency and non-emergency spill procedures.

- a. **Emergency Spills:** Non-incident hazardous chemical spills require an *Operations Level* response.
  - 1) Evacuate all personnel from the area.
  - 2) Close doors to contain airborne contaminants and prevent entry to the area. If possible, fume hoods should be utilized to remove hazardous fumes as quickly as possible.
  - 3) Notify the Local Emergency Response Unit: VA Police Services, extension 2222, and the Facility Safety Office, extension 821-6158. State the building, room number, the hazardous material, if a fire is involved, and if people are injured. The Emergency Response Unit will contain the hazardous material from a safe distance, keep it from spreading, and prevent exposures.
  - 4) Obtain an SDS sheet. Wait outside the room, **out of danger**, until help arrives.
  
- b. **Non-emergency Spills:** Incidental hazardous chemical spills, minor in size, *do not* require an Operations Level response.
  - 1) Contain the spill by applying the proper absorbent for the hazardous material. A Universal Absorbent is the absorbent to be used with most spills and is required to be in each laboratory. Spill Kits are wall-mounted throughout the Research Building. They are to be used, instead of Universal Absorbents, for the following hazardous spills: acid, caustic, solvent, and formaldehyde/ formaldehyde solution spills. Each kit contains neoprene gloves, goggles, plastic bags, twist ties, spatula, and canisters specific to the type of spill. The absorbent used should be applied around the edge of any liquid chemical spill to prevent it from spreading. The spilled chemical must be completely absorbed. Both absorbents are inert and will not react with the chemical. Remember - absorbents *will not neutralize the chemical!* Dispose of the absorbed chemical following these steps:
    - A. Wearing appropriate Personal Protective Equipment, scoop the absorbed chemical into a plastic bag with a spatula.
    - B. Tie bag with twist tie.
    - C. Place bag into a box and seal with tape.
    - D. Label box with name of chemical and the absorbing agent/material used.
    - E. Safely store box in lab until the next hazardous material pick-up, organized through the Facility Safety Office.
  - 2) Close doors to contain airborne contaminants and use fume hoods and fans to remove hazardous fumes as quickly as possible. (Fans should blow fumes toward a fume hood for expulsion.)
  - 3) Identify material and use the MaxCom safe use guide.
  - 4) Notify the RSC/CHO. At that time, the steps taken will be reviewed and a Spill/Release Incident Report will be submitted to the RSC and the Facility Safety Office.
  - 5) Contact E.M.S. to have the area thoroughly cleaned.

#### 4. **Biohazardous Agents:**

Laboratories working with biohazards must have access to a basic Biological Spill Kit. A Biological Spill Kit is housed near laboratories that work with biohazardous agents.

The following procedures are provided as a guideline to the clean-up of a biohazardous spill:

##### **a. All Spills**

- 1) If the spill involves *Clostridium difficile* spores or another biological agent that is able to survive on surfaces for a long period of time, please follow the guidelines for wipe-tests found in the Research Safety SOP, SRS-024, for Infection Control Monitoring to ensure complete clean-up of the agent and contact the Research Safety Coordinator (RSC) for further assessment.
- 2) Take appropriate measures to prevent the spread of the contamination (e.g., drips, tracking on shoes, etc.) to additional surfaces (e.g., floors, outside the lab, etc.).
- 3) Use a two-step cleaning/disinfection process of first removing contents of the spill or contaminated area with an initial bleach wipe/solution, then clean/disinfect with a new wipe to prevent cross contamination.

##### **b. Spill Inside a Centrifuge**

- 1) Remove all personnel from the room. Wait 30 minutes for any potential biological aerosol to settle before attempting to clean-up the spill.
- 2) Personal Protective Equipment (PPE):
  - a. For large spills (>100 mL), wear disposable coveralls, de-con boots, goggles, and gloves during clean-up.
  - b. For smaller spills (<100 mL), lab coat, goggles and gloves are sufficient for clean-up.
- 3) Remove rotors and buckets to the nearest biological safety cabinet using a secondary container to prevent drips.
- 4) Thoroughly disinfect inside of centrifuge, rotors, and buckets using disposable towels and 10% bleach, or bleach wipes using the two-step cleaning process. Place all contaminated wipes and paper towels into solid biohazardous waste containers for further processing by Environmental Management Service.
- 5) Remove contaminated debris, including PPE (disposable coveralls, de-con boots, and gloves) after disinfection, place into solid biohazardous waste containers for further processing by Environmental Management Service, and wash hands. Autoclave any reusable items (i.e., centrifuge tubes) after they are initially cleaned with bleach.
- 6) Remove and discard PPE at point of use and wash hands.

### c. Spill Inside the Laboratory

- 1) Remove all personnel from the room. Wait 30 minutes for any potential biological aerosol to settle before entering the spill area.
  - 2) Remove any contaminated clothing and footwear and place into a biohazard bag and sequester, then contact the RSC for further assessment on measures to take. Change into scrubs and/or de-con boots.
  - 3) If the spill made any contact with the person's skin, even thru clothing, first wipe the affected area thoroughly with a disposable towel, soap and water to remove any excess contamination, dry, then wipe with Chlorhexidine Gluconate wipes and allow to air dry to ensure germicidal action of disinfectant. Dispose all towels/wipes into solid biohazardous waste containers for further processing by Environmental Management Service.
  - 4) PPE:
    - a. For large spills (>100 mL), wear disposable coveralls, de-con boots, goggles, and gloves during clean-up.
    - b. For smaller spills (<100 mL), lab coat, goggles and gloves are sufficient for clean-up.
  - 5) Clean-up:
    - a. For large spills (>100 mL), cover and encircle the spill with absorbent and use a disposable spatula to scoop up waste into a biohazard bag, being careful to minimize aerosolization, and dispose into solid biohazardous waste containers for further processing by Environmental Management Service.
    - b. For smaller spills (<100 mL), cover and encircle the spill with paper towels being careful to minimize aerosolization, and dispose into solid biohazardous waste containers for further processing by Environmental Management Service.
  - 6) All items that were contaminated must be removed from the spill area, wiping each item thoroughly with bleach wipes using the two-step cleaning process. Autoclave any reusable items (i.e., centrifuge tubes, porous materials) after they initially cleaned with bleach. Broken glassware must be picked-up with forceps and disposed into a red hard-sided sharps box.
- Note: Do not pick up any contaminated sharp objects with your hands.
- 7) Wipe equipment with bleach wipes for designated contact time and rinse with water, if necessary, using two-step cleaning process. Dispose of all wipes into solid biohazardous waste containers for further processing by Environmental Management Service.
  - 8) Wipe off any residual spilled material, and clean/disinfect with the area, including the floor, with a new bleach wipe, using two-step cleaning process. Dispose of all wipes into solid biohazardous waste containers for further processing by Environmental Management

Service.

9) Remove and discard PPE at point of use and wash hands.

10) Re-open lab when decontamination is complete.

#### **d) Spill Outside the Laboratory**

1) Always transport biohazardous materials in an unbreakable well-sealed primary container placed inside a leak-proof, closed and unbreakable secondary container, labeled with the biohazard symbol (plastic cooler, bio-specimen pack, etc.).

2) Should a spill occur outside the laboratory, secure the area to ensure that the spill remains contained.

3) Contact the RSC at ext. 64263.

4) Do not attempt to clean up the spill without the proper PPE and spill clean-up materials.

#### **e) After a Spill**

1) Inform lab personnel, laboratory supervisor, the Principal Investigator, and the RSC about the spill and the decontamination process that took place.

2) Determine the root cause of the spill and propose a method to prevent this from happening in the future. This information must also be shared with lab personnel, laboratory supervisor, the Principal Investigator, and the RSC.

## **CHEMICAL STORAGE**

Some suggestions for storage of all types of chemicals appear on the following page. Consult the SDS for specific instructions.

1. Chemicals must be properly labeled (see **Chemical Labeling** on pages 7 – 8)
2. Chemicals must be stored on lipped shelves or in closed cupboards (below eye-level).
3. Check the physical condition of chemicals. Look for a change in color.
4. Store chemicals by compatibility, not alphabetically.
5. Some compounds, notably trichloroacetic acid, trifluoroacetic acid and acid chlorides slowly attack plastic caps.
6. Avoid exposing chemicals to heat or sunlight.
7. Store the smallest volume of hazardous chemicals on a countertop.
8. Store highly toxic chemicals on low shelves in unbreakable secondary containers.
9. Never house chemicals/glassware on the edge of a counter, hood, or shelf.
10. Quantities of a flammable or corrosive liquid (greater than four liters, but less than ten liters) must be stored in a flammable can. Quantities greater than ten liters must be stored within a flammable cabinet.
11. Keep flammable chemical and acid/base storage cabinet doors closed.
12. When cold-storage is required for flammable liquids, an explosion-proof refrigerator is required.



13. Flammable Cabinets are inspected annually. If found to be deteriorating (rust) or the integrity of the cabinet has been compromised, the storage unit must be replaced.
14. Chemicals are examined at least annually for replacement, deterioration, and container integrity.
15. Chemicals must not be stored on the floor.
16. Accept no chemicals with insufficient information on the labels.
17. Know the color-codes that some companies use on their labels:

<b>Red</b>	<b>Flammable</b>
<b>Blue</b>	<b>Health hazard</b>
<b>White</b>	<b>Corrosive</b>
<b>Orange</b>	<b>General storage</b>
<b>White Stripe</b>	<b>Separate storage (i.e., Water Reactive, Oxidizer)</b>

Strong acids such as hydrochloric, nitric, sulfuric, or perchloric must NOT be stored with or near strong bases such as sodium hydroxide or potassium hydroxide.

***NOTE: Acids and bases must not be stored in proximity.***

1. Acids must be stored away from flammable organic chemicals.
2. Large quantities of acids must be stored in an acid storage cabinet.
3. Bottles of perchloric acid must be stored inside of a glass beaker, in a fume hood. It must be kept away from easily oxidizable materials such as paper.
4. Strong bases must be stored away from acid, formaldehyde, and alcohol.
5. Vigorous OXIDIZING AGENTS such as dichromate salts, permanganate salts, molecular iodine, organic peroxides or peroxyacids, perchlorate salts, hydrogen peroxide (in concentrations greater than 3%) must be stored separately from readily oxidizable organic chemicals and materials such as paper. Concentrated nitric, perchloric and sulfuric acids also are strong oxidizing agents. Most solid oxidizing agents can be stored with each other.
6. FLAMMABLE ORGANIC SOLVENTS (e.g., ethers, alcohols, scintillation cocktail, xylene, pentane, etc.) must be stored in a flammable cabinet.
7. Compounds classified as flammable must never be stored in ordinary refrigerators or cold rooms.
8. Certain volatile TOXIC ORGANIC COMPOUNDS represent little or no fire hazard also should be stored and used in a fume hood. Some common examples of these compounds are methylene chloride, chloroform, 1,2-dichloroethane, and iodomethane.

## **PEROXIDIZING CHEMICALS**

Chemicals need to be monitored for disposal prior to expiration date, especially peroxide-forming reagents that may form explosive levels of peroxides with or without concentration. Peroxide-forming chemicals need to be tested semi-annually. Peroxidizing chemicals currently used in Medical Research include: Chloroform, 2-Propanol, and Chloroform-Isoamyl Alcohol.

Whenever you find *or suspect* that you have found a potentially explosive material:

1. DO NOT MOVE OR ATTEMPT TO OPEN THE CONTAINER. If a peroxidized compound forms within a screw-cap bottle, some of the potentially explosive material may rest within the threads inside the cap. Unscrewing the cap may initiate an explosion.
2. Post signage and alert personnel in your area of your discovery.

3. Contact the RSC/CHO at extension 64263 or the Facility Safety Office at 821-6159.
4. When a material is identified as explosive, the Facility Safety Office will contact the Cleveland Bomb Squad or a hazardous material hauler to arrange for proper handling and disposal.

*Additional state and federal requirements come into play when dealing with explosive materials.*

## COMPRESSED GAS HANDLING

Compressed gas cylinders have tremendous explosive potential. Caution must be employed in handling them. Some rules to follow are:

1. Strap/chain cylinder onto cylinder cart before transporting.
2. Clearly label the contents (e.g., oxygen, nitrogen).
3. Store all cylinders in cool, dry, well-ventilated areas.
4. Maintain as few cylinders as possible in the laboratory.
5. Use a chain or strap, with no slack, mounted 2/3 of the way up the cylinder's height. Secure *every* cylinder in an upright position. Each cylinder must be secured individually via a wall-mounted bracket. *Note: Cylinders are not permitted to be mounted to bench tops.*
6. Use the correct regulator for each gas type.
7. Open the main valve slowly with the regulator valve closed.
8. Close the regulator and main valves when not in use.
9. When a cylinder is empty or not in use, replace the protective cap and mark it "EMPTY." The empty cylinder *must* remain secured by a strap or chain until it is removed.
10. You must return all cylinders ordered through the VA to the warehouse. Call CWRU for pickup of cylinders ordered from *PraxAir*, which charges a monthly rental (demurrage) fee.
11. Do not use compressed air to clean work areas.

## HAZARDOUS CHEMICAL HANDLING

General precautions must be followed whenever any chemicals are handled. Additional precautions must be included when handling hazardous or extremely hazardous chemicals. Select carcinogens, reproductive toxins, and substances with a high degree of acute toxicity are handled in designated areas. Additional information can be found in the facility Chemical Hygiene Plan, which is located on the Occupational Health & Safety SharePoint site.

Hazardous chemicals may exert two general effects on the body:

1. ACUTE: Occurs immediately because of a single chemical exposure, e.g., a burn resulting from a strong acid coming in contact with the skin.
2. CHRONIC: Occurs because of repeated chemical exposures over a period of time, e.g., lung disease caused by breathing asbestos over a long period of time.

### GENERAL PRECAUTIONS:

1. Know as much as possible about a chemical *before* you start to use it.
2. Treat chemicals with unknown hazards with caution.

3. A mixture of chemicals should be handled using precautions required of its most hazardous component.
4. Avoid unnecessary exposure, e.g., *do not* mouth pipette. Mechanical devices must be used.
5. Always wear closed-toe shoes (open-toed shoes and sandals are not permitted).
6. Do not smell or taste any chemical.
7. Inspect all personal protective equipment before each use.
8. Use chemicals in ventilated areas.
9. Use the minimum amount of a chemical to accomplish the work successfully.
10. Handle equipment and glassware carefully.
11. Follow the Research Service Eating Policy.
12. Confine long hair and loose clothing.
13. Keep the work area clean and uncluttered. Clean up at the completion of a procedure or at the end of each day.
14. Lights should be left on and a sign should be posted on the door of any room with an unattended operation.
15. Provide containment of toxic substances in the event of a utility failure.
16. Never leave water-utilizing operations running overnight (cooling, deionizing, distilling, etc.).
17. Use a hood for procedures that release toxic vapors or generate dust.
18. Be alert to unsafe conditions and see that they are corrected when detected.
19. Never discharge concentrated acids or bases.
20. Never add water to acid . . . add acid slowly to water.
21. Maintain a clean laboratory to prevent air-borne contaminants and possible spills. Return unused chemicals to their proper storage areas. Clean equipment and bench-tops frequently; work on disposable laboratory bench paper and change it when soiled.

### **ALLERGENS AND EMBRYOTOXINS**

1. Handle allergens and embryotoxins in a fume hood that has a face velocity of 60 – 100 linear feet/minute.
2. Use appropriate personal protective equipment to prevent skin contact.
3. Review the use of these substances annually or whenever a procedural change is made.
4. Store these substances, properly labeled, in a ventilated area in unbreakable secondary containers.
5. Notify your supervisor of all incidents of exposure or spills; consult a qualified physician when appropriate (see Medical Consultation).

### **MODERATE, CHRONIC, OR ACUTE TOXICITY CHEMICALS**

1. Lab coats and gloves must be worn when handling these chemicals. Wash immediately after exposure to these materials.
2. Always use a hood or other containment device when performing manipulations that involve or generate aerosols, vapors, or dust.
3. Maintain records of the amounts of these materials on hand, amounts used, and the workers involved.
4. Always work on absorbent, plastic backed paper or within chemically resistant trays large enough to contain a spill.
5. If a major spill occurs, evacuate the area. Ensure that personnel wear appropriate protective apparel during cleanup.
6. Thoroughly decontaminate (by chemical conversion) or incinerate contaminated clothing or shoes.

## **HIGH CHRONIC TOXICITY CHEMICALS**

1. All work with these substances must be conducted in a controlled area.
2. A plan for use/disposal of these materials must be prepared/approved by the lab supervisor.
3. Decontaminate the controlled area before normal work is resumed there.
4. Decontaminate equipment before removing it from the controlled area.
5. When leaving the controlled area, remove all PPE and thoroughly, wash hands, arms, neck, and face.
6. If using toxicologically significant quantities of such a substance on a regular basis (e.g.,  $\geq 3$  times a week) consult the personnel health physician concerning regular medical surveillance.
7. Records must indicate amount stored, used, the dates of use, and the names of the users.
8. Ensure that the controlled area and the laboratory door are conspicuously marked with warning and restricted access signs. All containers with these substances must be appropriately labeled with identity and warning labels.
9. Chemically decontaminate waste whenever possible. All waste transferred from the controlled area must be contained in secondary, unbreakable containers and must be under the supervision of authorized personnel.

## **CANCER CAUSING AGENTS**

Carcinogens, mutagens, and teratogens are collectively referred to as "cancer causing agents".

Every laboratory must have a listing of their known and suspected cancer-causing agents in the laboratory safety notebook. Increased awareness and extra precautions must be practiced when handling these chemicals. The defensive action taken must be commensurate with the degree of toxicity and quantity of material to be handled.

1. Always wear all recommended PPE, e.g., a fully fastened lab coat, eye protection, gloves, and a face shield or respirator.
2. Store all suspected cancer-causing agents below eye level in a designated area in the laboratory.
3. Perform procedures involving the use of cancer-causing agents in a fume hood or other suitable containment device.
4. Clearly label a suspected cancer-causing agent, and any waste product containing it, "CANCER SUSPECT AGENT."
5. Clearly label all storage areas, storage containers and containment devices (i.e., refrigerators, shelves, carboys, hoods, glove boxes) "DANGER - CHEMICAL CARCINOGEN."
6. Any waste containing a cancer-causing agent is hazardous and must be disposed of following the 'Hazardous Chemical Disposal' and/or 'Infectious Material Disposal' procedures.

## **FORMALDEHYDE**

OSHA requires training on the proper use of formaldehyde at the initial assignment of duties, when a new formaldehyde procedure is introduced, when a procedure is changed, and annually. This training is conducted by the RSC/CHO and in the Talent Management System (TMS). See Medical Research Service [Formaldehyde Training](#) Module and Medical Center Policy OOS-027, [Formaldehyde](#). These documents establish policies, procedures, and practices in the safe use of formaldehyde in Medical Research Service and at this medical center.

## **SUBCOMMITTEE on RESEARCH SAFETY and SECURITY**

The Subcommittee on Research Safety and Security (SRSS) meets monthly to ensure:

1. Research projects involving hazardous materials are reviewed to ensure the safety of personnel.
2. Semi-annual safety inspections of laboratories are conducted.
3. Safety training is provided annually for all laboratory personnel.
4. An Occupational Health/Industrial Hygiene program is established.
5. Accidents are reported and investigated.
6. Safety issues are discussed with technicians and investigators.

The SRSS consists of at least five voting members that have been nominated by the SRSS and acknowledged by the R&D Committee and appointed by the Medical Center Director. Membership consists of:

Chairperson, SRSS  
Research Safety Coordinator  
Clinical Study Coordinator  
Infection Control, Prevention & Control Representative  
Rehabilitation Research and Development Representative  
Radiation Safety Officer  
Biological Laboratory Technician  
Research and Development Committee Representative, *Ex-officio*  
Facility Safety Specialist, *Ex-officio*  
AFGE Local #31 Union Designee, *Ex-officio*

Membership may also include an *Ex-officio* representative from Personnel Health Service.

## **OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS**

The following is a list of relevant OSHA regulations; all are published in the Code of Federal Regulations 29, chapter 1910 (29 = Labor/1910 = OSHA). Copies are available from the RSC/CHO:

Subpart I - Personal Protective Equipment:

- 1910.132 General Requirements
- 1910.133 Eye and Face Protection
- 1910.134 Respiratory Protection

Subpart J - General Environmental Controls:

- 1910.145 Specifications for Accident Prevention Signs and Tags
- 1910.147 The Control of Hazardous Energy (Lockout-Tag out)

Subpart Z - Toxic and Hazardous Substances:

- 1910.1000 Air contaminants
- 1910.1028 Benzene
- 1910.1045 Acrylonitrile
- 1910.1048 Formaldehyde
- 1910.1200 Hazard Communication
- 1910.1450 Occupational Exposure to Hazardous Chemicals in Laboratories

# CHEMICAL HYGIENE RESPONSIBILITY

Responsibility for Chemical Hygiene rests at *all* levels, including the:

1. Associate Chief of Staff/Research. This individual has the ultimate responsibility for chemical hygiene within Medical Research Service. ACOS/Research must provide continuing support for chemical hygiene with the assistance of other administrative officials.
2. Administrative Officer. This individual is responsible for chemical hygiene in Medical Research Service.
3. RSC/CHO. This individual must:
  - a) Work with administrators and others to develop and implement appropriate chemical hygiene policies and practices.
  - b) Monitor procurement, use and disposal of chemicals used in laboratories.
  - c) See that appropriate audits are conducted.
  - d) Help investigators/lab directors develop precautions and provide adequate facilities.
  - e) Be familiar with current relevant regulations.
  - f) Strive to improve the Chemical Hygiene Program.
  - g) Annually audit every PI's Research Program
4. Laboratory Director/Investigator. This individual must:
  - a) Ensure that workers are trained to know and follow chemical hygiene rules.
  - b) Provide and document formal chemical hygiene and housekeeping inspections.
  - c) Be familiar with current relevant regulations.
  - d) Determine the required levels of personal protective apparel and equipment.
  - e) Ensure that procedures, equipment, and facilities are adequate for the materials being used.
  - f) Maintain a record of laboratory specific training and annual retraining employees.
5. Laboratory Worker. Each laboratory worker must:
  - a) Plan and conduct their work in accordance with the Chemical Hygiene Plan.
  - b) Develop good personal chemical hygiene habits

## HAZARDOUS WASTE & CHEMICAL DISPOSAL

### Hazardous Chemicals

Hazardous chemicals must not be released into the environment. All chemical waste must be collected, stored in compatible containers, and remain in the laboratory until removed by the RSC/CHO. The Medical Center hires a Resource and Conservation and Recovery Act (R.C.R.A.) approved outside waste facility to dispose/destroy unwanted, non-infectious, hazardous chemicals. This includes exempt quantities of toxins that are not currently in use and for which there are no plans of immediate use.

The R.C.R.A. hazardous waste program regulates federal, state, and local government facilities that generate, transport, treat, store, or dispose of hazardous waste. This ensures proper management of hazardous waste from the moment it is generated until its ultimate disposal or destruction.

Removal of hazardous waste is expensive; chemicals should be recycled and/or volumes minimized whenever possible. The Facility Safety Office coordinates quarterly hazardous waste pick-ups. For each chemical to be disposed of, the container must have a HAZARDOUS WASTE label.

HAZARDOUS WASTE labels are located throughout the research corridors near green wall-mounted spill kits. Waste bottles must have this label affixed to it and clearly note the contents. Note: Do not fill in the date on this label; the Facility Safety Office fills in the date when it is picked-up for disposal.

Note: Each laboratory must keep a record of hazardous waste. This record must include the common name of the material(s), the volume or weight of waste, the container type (glass bottle/plastic container/metal drum/plastic pail/etc.), and the date of removal.

## **Pharmaceutical Waste**

Pharmaceutical waste (e.g., antibiotics) must not be released into the environment. Pharmaceutical waste must be collected and remain in the laboratory until removed by the RSC/CHO. The waste is then removed from the Medical Center via a Resource and Conservation and Recovery Act (R.C.R.A.) approved outside waste facility.

**Liquid Pharmaceutical Waste (in broth or similar substance)** – autoclaved liquid cultures must be collected in pails with 10% bleach; 10% bleach will stop the growth of biological agents within the pharmaceutical waste.

Each pail must have a hazardous waste label that reads, “Pharmaceutical Waste”. This labeling represents any antibiotic that may be used in Medical Research Service.

**Liquid Pharmaceutical Waste (in a hazardous chemical or a combination of hazardous chemicals)** – e.g., Acetonitrile/Formic Acid/Methanol, must be collected in glass bottles. Each bottle must have a hazardous waste label that reads, “Pharmaceutical Waste” with a listing of the specific chemicals within the container. This labeling represents any antibiotic that may be used in Medical Research Service.

**Solid Pharmaceutical Waste** – must be collected in 19 gallon red hard-sided Biological Sharps Boxes. Solid pharmaceutical waste includes petri dishes, 96-well plates, glass vials, microfuges tubes, conical tubes, etc. with or without liquid or agar.

## **PERSONAL PROTECTIVE EQUIPMENT (PPE)**

Personal Protective Equipment (PPE) provides a barrier to prevent contact with hazardous agents. PPE includes protective clothing, respiration protection, eye protection, shields, and gloves. PPE should be changed or cleaned regularly. Disposable equipment must not be reused. Remove any contaminated PPE immediately and decontaminate it or dispose of it as infectious material (see Infectious Material Disposal).

Restrict PPE use to contaminated areas to prevent contamination in unrestricted areas. DO NOT wear PPE outside of the laboratory. Before using any chemical, consult the SDS and review your Hazard Assessment Statement (located in the red labeled SAFETY notebook) to identify the correct PPE to use.

### **PROTECTIVE CLOTHING**

Coveralls, aprons, lab coats, gloves, and boots help reduce skin contact with chemicals. These items must be changed immediately if they become contaminated with a hazardous chemical. Used lab coats and aprons

should be washed at least weekly. All personnel must wear a lab coat when working with chemicals.

## **GLOVES**

Hands and forearms are most likely to come into contact with hazardous chemicals. Gloves and lab coats provide the best protection against skin exposure. When transporting materials outside of the lab, wear clean gloves, use a cart (or bottle carrier), and carry an extra pair of clean gloves in the event the first pair becomes contaminated. *When in doubt (regarding the proper gloves to wear) review section 8 (personal protective equipment) in the SDS.*

1. Disposable (single-use only) examination gloves provide protection against biological fluids and minimally hazardous chemicals. Non-latex disposable gloves are available for personnel with latex allergies and sensitivities. Disposable examination gloves do not provide adequate protection against corrosive materials or halogenated hydrocarbon solvents.
2. NEOPRENE or NITRILE rubber gloves are necessary when working with halogenated solvents, corrosives (such as strong acids and bases) or solutions of oxidizing agents. After each use, rubber gloves must be washed with soap/water and examined for pinholes, tears, or cracks.
3. Re-usable gloves (neoprene/nitrile, utility, autoclave, cryogenic, etc.) must be kept in an uncompromised (no holes, cuts, etc.), clean, and sanitary condition.

**\*\* WASH HANDS AFTER USING ANY CHEMICAL IN THE LABORATORY  
(REGARDLESS OF WHICH GLOVES ARE USED) \*\***

All laboratories (where chemicals, biological agents, etc. are handled) must have working sinks for immediate hand washing.

## **EYE PROTECTION**

Eye protection is provided and used for work that may involve splashes of hazardous materials. Utilize the following types of eye protection as appropriate to your work:

1. **Anti-UV Glasses/Face Shields** are designed to block ultraviolet rays. Wear them whenever using UV light. Most ordinary eyeglasses do not block UV rays.
2. **Side Shielded Safety Glasses** primarily offer protection from potential splashes.
3. **Face Shields** protect eyes and face from direct contact with chemicals.
4. **Goggles**, along with a **face shield**, offer the best eye protection from chemical contact.

## **HEARING (NOISE) PROTECTION**

Medical Center Policy OOS-024, Hearing Conservation Program, is designed to protect those employees at risk from hazardous noise. If there is a concern about hazardous noise levels, the Facility Safety Office should be contacted for monitoring.

1. Safety “ earmuffs” seal around the ears to block harmful noise (compliant with ANSI\* S3.19-1974). These are available upon request from the RSC. Note: “Earmuffs” are re-usable but must be cleaned with an alcohol wipe between uses.
2. Earplugs, made of thermal-reactive foam, conforms to the ear canal to provide a low-pressure seal for hearing protection (compliant with American National Standards Institute (ANSI) S3.19-1974). These are single-use earplugs and are available upon request from the RSC.



## **RESPIRATORY PROTECTION**

Before using any respiratory protective equipment, Medical Center Policy (MCP) OOS-029 Respiratory Protection must be followed\*. Contact the Facility Safety Office for questions regarding respiratory protection.

\*Prior to obtaining a respirator, personnel must complete/submit Attachment A, Medical Determination of Ability to Use Respirator (MCP OOS-029 Respiratory Protection) to Personnel Health. Once clearance to wear a respirator is granted by Personnel Health, personnel must complete initial respiratory training (provided by the Facility Safety Office – in person or virtually) and annually thereafter.

## **MONITORING VAPOR-FORMING CHEMICALS**

Laboratory personnel that may be at risk of exposure to air contaminants must be monitored. A monitoring device (dosimeter) is provided by the Facility Safety Office and is worn for an entire 8-hour workday. Monitoring should be conducted when working with/near hazardous vapor forming chemicals (as defined by OSHA) in large quantities or when the same chemical is used greater than or equal to three times a week.

Concerns about air quality/safety must be directed to the RSC/CHO. **NOTE:** *Any* vapor-forming chemical can be monitored.

## **CONTRACTORS**

Contractors performing work in laboratories must be notified of all hazards they may come in contact with or direct hazards they may be exposed to when servicing a piece of equipment. This policy applies to anyone entering the laboratory, including painters, engineers, environmental management personnel, and visitors. Personal protective equipment (PPE) should be supplied when necessary.

Before sending a piece of equipment out of the facility to be serviced, every attempt must be made by laboratory personnel to decontaminate it. The contractor must be notified of the hazardous material used with the equipment and the decontamination process used before shipping. Also, inform on-site repair technicians that a piece of equipment may be contaminated before necessary repairs are made.

A contractor working with hazardous chemicals in your laboratory *must* inform you of the hazards you may come in contact with. Also, you must be informed of the proper PPE for these hazards.

## **EMERGENCY PROCEDURES**

### **DISASTER & DISASTER DRILL PROCEDURES**

"The Disaster Plan and Reference Guide", available from the Facility Safety Office, defines a disaster as "a sudden unplanned event that taxes a health care facility's ability to deliver necessary services." Disasters are announced over the Public Address (PA) system, which states "The disaster plan is in effect."

Medical Research Service employees have no alternate duties during a disaster. They must remain at their duty stations and continue working unless directed to evacuate or lend assistance. In the event that Research employees are asked to evacuate, they should report to the grassy area in front of the hospital (East Boulevard) so they may be accounted for. No one should leave the premises without being accounted for.

During a disaster/disaster drill, do not use the phone. Those in position to respond to a disaster/disaster drill require access to the phone lines. The end of a disaster drill will be signaled by the PA announcement, "stand-down."

## **FIRE & FIRE DRILL PROCEDURES**

The Fire Alarm System involves the following:

1. A Fire Alarm Siren.
2. An audio indicator identifies the following areas in Medical Research Service:

<b>a. "Second Floor Research"</b>	<b>Rooms K-201 – K-220</b>
<b>b. "First Floor Research"</b>	<b>Rooms K-101 – K-122</b>
<b>c. "Basement Research"</b>	<b>Room B-F311 – B-F466</b>
<b>d. "Basement West"</b>	<b>F.E.S. Center and Basement Laboratories</b>
<b>e. "Basement Rehab. Medicine"</b>	<b>Room B-B322 (Motion Studies Lab).</b>
3. A strobe light at each alarm station.

The above alarm system will continue to sound in the affected area of the hospital until the situation has been resolved. Unaffected areas of the hospital will receive four rounds of the alarm system; strobe lights remain flashing throughout the hospital until the situation has been cleared. If the alarm indicates another zone, check local fire doors to be certain they have closed.

### **ACTIVATION of the FIRE ALARM SYSTEM:**

**Always call extension 2222 to confirm incident whether alarm system is active/inactive.**

Call **FIRE/EMERGENCY**, extension 2222 (*after* removing yourself/others from lab/office). Tell the operator:

1. The type of emergency.
2. Room number.
3. Service.
4. Your name and extension.

If the Fire Alarm System is down, the operator will initiate the internal alert system. "Mr. RED", followed by the room number, will be announced via the Public Address (PA) System every two minutes until the fire has been contained.

**Fire Alarm Pull Boxes** are located near each stairway, exits from the building, and the Research elevator.

**Sprinkler Devices** are located throughout Medical Research Service to provide immediate attention when smoke and or a fire is detected. There must be a minimum of 18 inches of vertical clearance from the sprinkler heads, heating pipes, and lighting fixtures to provide a full and effective spray.

After four cycles, the fire alarm siren and audio location identification will be limited to the floor of origination. The strobe lights will remain activated throughout the entire medical center until the Cleveland Fire Department renders the situation "clear".

When a fire **cannot be contained**, the **R.A.C.E. Procedure** must be implemented:

- (R)**emove yourself and others from danger.
- (A)**ctivate an Alarm Pull Box or call extension 2222.
- (C)**onfine the fire by closing doors.
- (E)**vacuate personnel from the building.

When a fire **can be contained** (i.e., within a paper basket) laboratory personnel are responsible for knowing the location and proper operation (**P.A.S.S.**) of a fire extinguisher.

- (P)ull the pin.
- (A)im at the base of the fire.
- (S)queeze the trigger.
- (S)weep back and forth until the fire is out.

**Dry Chemical Fire Extinguishers:** Every laboratory in Medical Research Service has an ABC type fire extinguisher mounted in an easily accessible place in the room. Do not block sight of or access to the extinguisher. Fire extinguishers must be accessible within 75 feet of your workspace (fire closets cover rooms without an extinguisher).

Class ABC extinguishers extinguish three basic types of fires:

- (1) Type A: Fires that consist of ordinary combustible materials (paper, wood, cloth, etc.)
- (2) Type B: Fires that consist of flammable liquids, oil grease, and flammable gases.
- (3) Type C: Fires that consist of energized Class A or Class B materials involving electrical equipment.

After the fire has been extinguished, the employee must call the VA Police and Security Office at extension 64207. The site of the fire will be inspected by the VA Fire Marshall to ensure that the fire has been completely extinguished. Also, the employee and RSC/CHO must complete a Fire Incident Report.

**NOTE:** *Care must be used in operating this extinguisher because the horn becomes extremely cold and can freeze flesh upon contact.*

### **EVACUATION:**

Employees must leave the building using the closest available exit or move to another zone within the hospital. Employees will not be permitted to return to their work area until VA Police and Security issue further instructions.

*Elevators are non-operational in the event of a fire.*

**NOTE:** *To smother flames on your clothing: STOP (do not run), DROP (to the floor), and ROLL (until flames have been smothered).*

### **EMERGENCY OVERHEAD PAGING CODES**

The following is a list of Emergency Overhead Paging Codes to be used when emergency assistance is needed. Dial extension 2222 for:

**Code Blue** – Medical help is needed.

**Code Violet** – Individual is exhibiting violent behavior.

**Code Silver** – Individual is in the process of harming another person with a weapon.

**Code Brown** – A lost/confused patient roaming the hallways.

**Code Orange** – Hazardous Spill

**Code Red** – Fire.

# ENGINEERING CONTROLS

The following safety devices are available to make the working environment safe for Medical Research employees:

## EMERGENCY EYEWASH/SHOWERS STATIONS

Emergency eyewash/shower stations are located throughout Medical Research Service where hazardous agents are used. In the event of a hazardous material splash/spill, each employee must know the location of the nearest emergency eyewash/shower station (vision is often compromised at the time of injury).

All eyewashes and showers must have an inspection tag that indicates inspections are performed on a weekly basis. Eyewashes/showers must be run weekly to prevent contaminant build up.

## BOTTLE CARRIERS

Bottle carriers are heavy, break-resistant, plastic containers that prevent breakage. They are available from the RSC. Glass bottles must be placed in them *every* time they are transported outside of the laboratory. They are available in 4-liter sizes. If many glass bottles are being transported together, a cart should be used, and the bottles contained.

## COLD ROOMS

Cold rooms are constant 4°C walk-in units located in Medical Research Service. The air in a cold room is re-circulated; flammable or hazardous chemicals **must not** be stored in these rooms (*dry ice and liquid nitrogen are forbidden*). When such fumes are concentrated, they pose explosion and health hazards. *Due to the storage of equipment and hazardous materials, cold rooms must be locked when not in use.* Cold rooms may be used for storage as long as every item:

1. Is non-flammable.
2. Requires refrigeration to maintain usefulness.
3. Is off the floor.
4. Is properly labeled with chemical name, hazard information, investigator's name, date opened, and target-organs (when appropriate).

Note: *Cold Rooms are never used to store food, beverages, or medications intended for human consumption or use.*

With a constant temperature of 4° Celsius, work within a Cold Room must be limited. Plan your work to minimize the amount of time spent within a Cold Room.

Cold rooms are inspected semi-annually.

## EMERGENCY POWER

Emergency power is available in Medical Research Service. In the event of a power failure, the emergency generator will begin to supply power to the hospital. To reduce the demand on the generator, power is only supplied to the red outlets. The hospital has many life supporting machines connected to this power source, so it is important that the red outlets be used only for devices requiring uninterrupted power. Examples of such devices are computers, -80° Celsius freezers, etc. Please be considerate in your use of these outlets.

## **FUME HOODS**

Fume hoods are available in most laboratories. They should be employed often because they are an easy way to avoid hazardous dusts and fumes. Labels mark the upper and lower boundaries for proper sash placement. Keeping the bottom edge of the sash at or between these labels will provide the maximum airflow rate into the hood without back draft. Fume hood sashes also provide a physical barrier from hazards, i.e., corrosives and dust-creating manipulations.

The RSC/CHO, under the direction of the OH&S, annually measures the face velocity for each hood in Medical Research Service and performs a “visual” inspection quarterly to ensure each hood has pull (as indicated by a long narrow piece of Kim Wipe® being drawn-into the fume hood). For work with chemicals of Moderate Chronic or High Acute Toxicity, always use a hood with a face velocity of at least 60 linear feet per minute (Code of Federal Regulations, Occupational Safety and Health Administration, Labor, 1910.1450, E, 3, c). The sash of a fume hood is best kept at a mid-range between 60 and 100 linear feet per minute. This will allow maximum protection from vapor forming chemicals.

The configuration and number of items within a hood must remain constant. If you believe that the air patterns have changed due to materials being added/removed from the hood, please contact the RSC/CHO to have the airflow monitored.

A long narrow piece of Kim Wipe® must be taped to the bottom edge of the sash for day-to-day monitoring. This indicator will be drawn inside the hood when the hood is functioning properly. If a fume hood malfunctions, contact the RSC/CHO to submit a work order. Do not use it until the problem has been corrected.

Vents and ductwork must not be obstructed. Do not use a hood for storage. Items within the hood may interfere with airflow. All materials used in the hood must be placed at least six inches back from the edge to prevent spillage and to maximize airflow. To minimize exposure risk, and avoid inhaling vapors, open all containers inside the hood. Also, ensure that all chemical containers are closed tightly when finished with a procedure. Note: Never use a fume hood for the evaporation of a chemical.

## **HOUSEKEEPING**

Environmental Management Service (EMS) personnel are responsible for housekeeping duties (trash pick-up, mopping floors, providing hand soap and paper towels, etc). In addition, they dispose of rinsed-clean chemical bottles (glass recycling bins), boxes, and biohazardous waste. \*See page 25 for Biological Waste Disposal.

### **Sharp Material Disposal/Storage**

All sharp materials must be disposed of with extra care. These materials must be separated into infectious and non-infectious categories:

1. **Non-Infectious Sharp Material Disposal:** Non-infectious sharps (broken glass, pipettes, pipette tips, and other rigid plastic materials) must be disposed of in a hard-sided sharps box or any heavy cardboard box. If using a heavy cardboard box, it must be well marked "DANGER - SHARP MATERIALS". Sharps boxes must be stored in low-traffic areas to prevent spillage.

***NOTE: Sharps Boxes may be filled only 75% full. Never transfer the contents/reach into a Sharps Box!***

2. **Infectious Sharp Material Disposal:** Needles, syringes, blades, pipettes, pipette tips, glass, etc. that come into contact with infectious material (blood, media, etc) **must** be placed into a hard-sided, covered sharps box. An outside contractor (managed by EMS) supplies sharps boxes and replaces them on a **weekly**

**basis.** When *not in use*, Sharps Boxes must be closed.

**3. Storage of Sharp Materials:** Sharp materials must be stored in boxes or trays to limit possible injury. Needles are *never* re-capped and must be disposed of after use. Razor/scalpel blades used for cutting filters, nylon membranes, etc that are to be re-used must also be stored in boxes or trays.

Sharp material *must* be secured during transport, i.e., lab-to-lab / floor-to-floor, to prevent accidental loss of needles, etc. while on route.

## **LAUNDRY SERVICE**

The LSCDVAMC provides laundry service for protective clothing (lab coats, uniforms, scrubs, etc) worn while performing work duties. A laundry identification number will be assigned at the Uniform Exchange Room for VA-owned and personally owned uniforms/lab coats, which is located on the first floor, room E-105. Use permanent ink to print this number inside the collar of the uniform/lab coat. To receive a uniform/lab coat, obtain an authorization form (VA Form 10-1148, available in K-117) signed by the ACOS/Research or your supervisor and take it to the Uniform Exchange Room. All uniforms/lab coats must have known hazardous contaminants removed before they are submitted for laundering. Do not wash them at home.

## **LIPPED SHELVES**

To prevent breakage, chemicals and glassware must be stored on lipped shelves or in cabinets with closed doors below eye level. Engineering Service will install lips on shelves when a work order is submitted.

## **WORK ORDERS**

Electronic work orders, for physical plant maintenance or installation of equipment, are submitted to Engineering Service for review and action. Safety related work orders are a priority and must be completed within 30 days. Work orders should be submitted to the RSC/CHO. A work order must give the name and phone extension of a contact person, the room number where the work is to be done, and description of work.

## **BIOLOGICAL WASTE DISPOSAL**

All *non-sharps* (gloves, paper towels, plastic-ware, etc.) contaminated with an infectious agent *must* be placed in an autoclavable biohazard bag; this is supplied by Environmental Management Service (EMS), extension 4270. Needles, syringes, pipettes, pipette tips, and anything that could potentially puncture a biohazard bag must be disposed of via a Sharps Box; see page 22.

Biological laboratory waste, i.e., bodily fluids, cells, etc., must be collected into compatible containers (capped/secured centrifuge tubes, etc.) and be disposed into red or orange labeled biohazard bags. This will help to prevent any unnecessary leakage within the biohazard bags.

When a biohazard bag is 75% full:

- Dispose into a red labeled biohazard barrel within a Cold Room within Medical Research. EMS removes, autoclaves, and disposes of waste as needed.

## LOCK-OUT/TAG-OUT

Lock-out/Tag-out is a method employed to prevent injury when a piece of equipment is damaged or when routine maintenance/repair is necessary. If Lockout/Tagout is necessary, please contact Engineering Service.

## PERSONNEL ACCIDENT PROCEDURE

Anyone who has had an accident, been injured (on medical center grounds), or has a work-related illness must report to Personnel Health Services for treatment.

Accidents that occur while an employee is in official travel status also must be reported. The employee's immediate supervisor, or the supervisor of the area where the accident occurred, must be informed as soon as possible.

For accidental hazardous material contact, immediately follow first aid procedures listed on the SDS for the chemical. In general, for skin and eye contact, flush the affected parts with water at an emergency eyewash station/emergency shower for 15 minutes. Refer to the SDS if the chemical has been ingested. As soon as possible, report to Personnel Health Services and provide an SDS for the chemical involved.

The supervisor is responsible for:

1. Recommending medical treatment for the injured employee. Personnel Health Services is located on the basement-level of the Medical Center, room B-AC250 (x63557) past the Out-patient Pharmacy. After the regular work hour shift (8:00am to 4:30 pm, Monday through Friday) employees need to report to the Emergency Department.
2. Investigating the accident to determine its cause and to determine a corrective action, this will prevent the accident from reoccurring.
3. Initiating the corrective action within ten working days of the accident.
4. Completing the supervisor's report in the ASISTS accident reporting computer system.

The employee must:

1. Complete the employee report in the ASISTS accident reporting computer system.
2. Cooperate fully with the supervisor's investigation of the incident.

Case Western Reserve University (CWRU) employees should report any accident to their supervisor and obtain non-emergency medical attention from the CWRU Health Services Center on Adelbert Road. Emergency medical care will be provided through Personnel Health Services: Basement-level of the Medical Center, room B-AC250 (x63557) past the Out-patient Pharmacy. After office hours, emergency medical attention can be obtained from the Emergency Department. An ASISTS accident report must be filed with the VA.

## MEDICAL REQUESTS

The VA Medical Center will provide all employees who work with hazardous substances an opportunity to receive medical attention, including any follow up examinations deemed necessary by the examining physician, free of charge, in any of the following cases:

1. When symptoms of overexposure are noted.
2. When exposure monitoring reveals that exposure routinely exceeds the action level (or PEL) for

- an OSHA regulated substance.
3. When there is a spill, leak, or other event resulting in the likelihood of a hazardous exposure.

Only necessary information will be supplied to the physician so that appropriate tests and accurate recommendations can be made. The supervisor will obtain a written opinion from the doctor including:

1. Results of the examination and any test results.
2. Identification of any medical condition revealed during the examination, which increases the employee's risk when exposed to hazardous chemicals.
3. Recommendations for follow-up.
4. A statement indicating that the physician has notified the employee of the results.

Findings unrelated to occupational exposure will not be revealed. For a more detailed description of the employee's rights, see 29 CFR 1910.1450 (g) available from the RSC/CHO in K-117.

## IMMUNIZATIONS

Free immunizations are given to all VA and non-VA employees at the Medical Center. These immunizations include Hepatitis B, Measles, Mumps, Rubella, Influenza, Tetanus/Pertussis, and COVID-19. The rabies vaccine can also be made available.

Prospective new employees will be screened for Tuberculosis (TB) with an in-house Interferon Gamma Release Assay (IGRA) blood test, regardless of any previous testing history. Due to the low incidence of TB in our institution, current CDC guidance does not support routine mandatory serial screening of employees. Refer to MCP 011-031 Tuberculosis Control Program for details.

Vaccines are administered in Personnel Health Services, basement-level of the Medical Center, room B-AC250 (x63557) past the Out-patient Pharmacy. Call in advance for an appointment.

**NOTE: Read all informational literature/treks prior to receiving any vaccination.**

## SMOKING

Smoking is prohibited on the Louis Stokes Cleveland VA campus.

## ELECTRICAL SAFETY

Personal electrical equipment (answering machines, coffee pots, microwaves, radios, refrigerators, etc.) must be inspected by the RSC/CHO who documents the inspection with a green safety sticker.

Electrical cords must:

1. Be in good condition; no frays or cuts in the protective wrapping.
2. Be bundled and secured to prevent clutter.
3. Be kept away from water sources and never be wrapped around metal fixtures.

Only Engineering Service-approved extension cords shall be used, but not as permanent wiring. Three prong to two prong adapters are not allowed.



Ground Fault Interrupter (GFI) electrical outlets must be used in wet/high risk areas.

Red outlet boxes are emergency outlets that continue to receive emergency power in the event of an electrical outage. Life support systems place a large demand on emergency power; only those items that absolutely require continuous power to maintain usefulness (freezers, computers) may be plugged into these outlets.

## **PHYSICAL HAZARDS**

Physical hazards include the following:

- (1) Ionizing and non-ionizing radiation,
- (2) Noise,
- (3) Vibration,
- (4) Extremes of temperature and pressure,
- (5) Explosive hazards,
- (6) Electrical hazards,
- (7) Mechanical hazards and
- (8) Sharps.

The above-noted Physical Hazards must be addressed to minimize personnel risk and ensure regulatory compliance. Routine laboratory inspections by facility safety personnel and research personnel must include a review of all potential physical hazards. The Research Safety Coordinator schedules inspections with program managers, service technicians, individuals with technical expertise, and receives inspection results from various services throughout the facility, e.g., Radiation Safety, Engineering, etc.