**VA WESTERN NEW YORK HEALTHCARE SYSTEM**

**LABORATORY SAFETY STANDARD OPERATING PROCEDURE**

**GENERAL OPERATING PROCEDURES**

Review the potential hazards of chemicals used in the laboratory and know the location of emergency call numbers, emergency showers, eye washes, fire extinguishers, first aid kits and spill kits. The Principle Investigator or Lab Safety Manager should review the emergency procedures with all personnel making sure that supplies and equipment are available for responding to laboratory accidents. Practice good housekeeping to minimize unsafe work conditions. Make sure all exits are free from obstruction. Keep safety equipment updated and easily accessible.

 You must wear appropriate personal protective equipment (lab coats, nitrile gloves, respirators, safety goggles) when required. Minimize skin exposure and avoid synthetic fabrics where flammable liquids and reactive chemicals are being used. Shoes should be closed toed and slip resistant. Long hair and loose clothing should be restrained. If your skin should come in contact with any chemical regardless of its toxicity, wash immediately and seek medical intervention if necessary.

Allergens include a wide variety of substances that can produce a skin or lung hypersensitivity. Always conduct aerosol producing activities in a fume hood. Always use appropriate PPE for the chemical you are working with. Immediately remove personnel from exposure should an allergic reaction appear and seek medical intervention.

You should never work alone or after hours when you are using hazardous chemicals. When you are working with hazardous experiments never leave them unattended. Never remove chemicals, biological agents, or radioactive materials from the facility without proper authorization.

Be familiar with the location of emergency equipment - fire alarm, fire extinguisher, emergency eye wash and safety shower. Know the appropriate emergency response procedures.

Never mouth pipet chemicals when transferring solutions. Instead, you should

always use a pipet bulb to transfer solutions.

Never leave an experiment unattended while it is being heated or is rapidly

reacting.

Laboratory water sources and deionized water should not be used for drinking

water.

**FOOD OR DRINK IS NEVER ALLOWED IN THE LABORATORY AT ANY TIME!!!**

**PROCEDURE FOR PROPER LABELING, STORAGE AND MANAGEMENT OF CHEMICALS**

Manufacturer labels should never be removed. All chemicals should be labeled with the date received and the date opened. All secondary chemical and waste containers should be clearly labeled with the full chemical name (no abbreviations or formulas) and never filled past the 90% capacity of the container. All chemical and hazardous waste storage areas should be labeled clearly with the hazardous nature of the chemicals.

All Principle Investigators are required to maintain the MSDS sheets for every chemical present in their lab either in hard copy or on MAXCOM. It is their responsibility to make sure all lab personnel knows how to access and understand this information.

There should be a specific storage area for each chemical and it should be returned to that location when you are finished with it. All chemical containers should be in good condition to prevent leakage. All chemicals and waste should be stored according to their compatibility. It is important to review the chemicals on the MSDS sheets for specific storage requirements and incompatibilities. Physical barriers such as storage cabinets should be used for these chemicals.

Secondary containers should always be used for liquid chemicals. Never store liquid chemicals over dry chemicals unless they are in secondary containers. The material of the secondary container should always be compatible with the chemical it is holding and should be large enough to hold the entire contents of the chemical if there should be leakage.

Chemicals should never be stored in hoods or on bench tops and should never be exposed to sunlight or heat. All storage cabinets should be secured and shelving should have a front edge lip.to prevent chemicals from falling. Flammable and corrosive cabinets should be used when necessary. All liquid chemicals should be stored below eye level, and should not be stored where they can be broken or spilled (e.g. bench top, floor). Never store chemicals near emergency equipment, aisles, or exits.

All chemicals must be inventoried. This provides a method for tracking, ordering and re-ordering and waste disposal that complies with the maximum allowable quantity according to Building and Fire Codes within the facility. Never over purchase quantities of chemicals and dispose of unused portions according to disposal directions.

**PROCEDURES FOR USE OF CHEMICAL FUME HOODS**

Chemical fume hoods must be used for any chemical procedure that has the potential to cause harm such as airborne, flammable/combustible or explosive. Vertical fume hoods can be used in three positions: closed, half-opened or fully opened. Hoods must be closed when unattended. When you are working with chemicals, the front sash should be at operating height (half opened) acting as a protective barrier between personnel and the chemicals. The setup position (fully opened) should only be used when you are placing equipment in hood. Never use a hood fully opened when chemicals are present. All chemicals should be placed at least 6 inches from the edge of the hood.

Chemical fume hoods must be kept clean and free of debris in order to avoid obstructing the rear baffles and exhaust ducts. Minimizing the amount of equipment in the hood will allow for the airflow across the work surface to be maximized. Never store chemicals in the fume hood because it can create a serious problem in the event of a spill, fire or explosion.

**PROCEDURES FOR HANDLING COMPRESSED GASES**

All cylinders must be marked with a label clearly identifying its contents. Check each cylinder and the valve for damage prior to use. If damage is found, the cylinder must be taken out of use immediately and returned to distributor for repair.

All gas cylinders (full or empty) must be fully secured above its mid-line with linked chains or belts with buckles. When transporting cylinders, you must use a hand cart equipped with belt or chain and the valve must have a safety cover on.

You must only use a pressure-regulating device at all times to control the flow of gas from the cylinder. Make sure the main cylinder valve shut off when not in use. The correct position for the main valve is all the way on or all the way off. Once the cylinder is connected, check for leaks at the connection. Regulators and valves must be firmly tightened with the proper sized wrench as not to damage the nuts. Never place a cylinder near heat as they have the potential to explode if exposed to high temperatures. Gases shall not be transferred from one cylinder to another.

When the cylinder is not in use, it must be stored with the main valve closed and safety cap in place. Cylinders waiting for use must be stored according to their hazard class. Empty cylinders should be stored separate from full ones.

When using flammable gases, no more than two cylinders can be manifolded together. These cylinders must be grounded however, never ground to an electrical outlet. Valves must be turned to off position when the laboratory is unattended. Never extinguish flames until the gas has been safely shut off as it can reignite causing an explosion.

**ELECTRICAL SAFETY PROCEDURES**

**Electrical panels and switches should always be free from obstruction.**

Electrical equipment should be inspected to ensure the safety of the personnel. Frayed or cracked wires should be repaired immediately. This equipment should not be stored near corrosive chemicals because they can erode the insulation of the wires. All faulty equipment must be removed immediately from service until repaired.

All electrical outlets should have a grounding connection that requires a three-pronged plug. All electrical equipment should have a three-pronged plug or entirely encased in plastic (e.g. microscopes, electric pipetters). Face plates should never be removes from the outlets. Use only grounded extension cords with three-pronged plugs and secured to avoid tripping hazards.

All flammable liquid containers must be properly grounded to avoid static electricity because it is a great ignition source.

**SAFE HANDLING OF GLASSWARE AND SHARPS**

Reusable syringes that are not biologically contaminated must be sanitized, capped and stored after use. A disposable syringe should be used for biological contaminants and disposed of in a sharps container. **DO** **NOT RECAP NEEDLES!**

Chipped, cracked or broken glassware should be disposed of. Only thick walled pressure resistant glassware should be used under pressure or vacuum to avoid sharp projectile breakage. Always use protective gloves when placing tubes on glass connections or when picking up broken glass or other sharp objects. Please place the objects in a designated sharps container.

**WORKING SAFETLY WITH ANIMALS AND CHEMICALS**

All researchers administering chemicals to animals must understand the hazards of the chemicals, proper procedures to follow, provide PPE and protocol specific training to all personnel handling the animals and administering the chemicals.

All chemicals must be used in designated areas, including live animals and open contaminated cages. Signs must be posted designating the area to be used. The chemical must be handled in a containment site, or within a closed system. Containment sites include fume hoods, glove boxes or biosafety cabinets that are vented outside the building. Closed systems include plumbing within instruments, cannulas, syringes, gavages etc. as long as the chemical is not exposed to the atmosphere. If there is no containment available then PPE assigned by The Subcommittee of Research Safety must be used by all personnel in the area.

Appropriate PPE for the hazardous chemical being used is required at all times. Procedures for waste removal must be established prior to disposal. All animal carcasses and tissue are disposed of as medical waste. Place them in a biohazard bag labeled with a biohazard symbol.

**LASER AND RADIOACTIVE MATERIAL**

All rooms using either lasers or radioactive materials are monitored quarterly by the Health and Physics Department. Do not initiate any work with lasers or radioactive material until all approvals and health assessments have been completed by the Health and Physics Department.

**LABORATORY INSPECTION PROCEDURES**

Laboratory inspections will be performed once every quarter. The SRS Committee Chair, SRS Coordinator and a representative from VA Safety Department will perform the inspection using the VHAWNY Laboratory Safety Inspection Checklist (Appendix A). The results will be reported to the AO and the ACOS, along with a report to the Principle Investigator with any deficiencies and findings. Any deficiencies will be reported to the SRS Committee and continued deficiencies will be reported to The Research and Development Committee.

**AUTOCLAVES**

Autoclaving usually is considered to be the method of choice for decontaminating cultures, laboratory glassware, pipettes, syringes, or other small items known to be contaminated with infectious agents. Autoclaves must be loaded carefully to allow the steam to penetrate the wrapping, since the steam has to contact the pathogens in order to destroy the hazard. The length of time required for sterilization of biological material is determined by the quantity of the load, the volume of liquid in the load, and the density of the material.

Safe work practices when utilizing an autoclave include the following:

1. Read the operating manual carefully and post the operation procedures near the

autoclave.

2. Release pressure slowly and open the door only slightly to allow the steam to

escape before unloading.

3. Wear insulated gloves when unloading the material.

**REFRIGERATORS**

The storage of flammable or combustible liquid in a domestic refrigerator is prohibited. All laboratory refrigerators must be labeled as safe or unsafe for the storage of flammable liquids. Refrigerators procured for the purpose of flammable liquid storage must be in compliance with the specifications for a Flammable Materials Storage Refrigerator as described in the NFPA Code 45, "Fire Protection for Laboratories Using Chemicals".

**APPENDIX A**

**VA Western New York Health Care System Laboratory Safety Inspection Checklist**

**Principle Investigator\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Room#\_\_\_\_\_\_\_\_\_\_ Date\_\_\_/\_\_\_/\_\_\_\_**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **General Lab Safety** | **Yes** | **No** | **n/a** | **Comments** |
| Lab is maintained secure; door is locked when not in use |  |  |  |  |
| Laboratory Equipment is labeled for laboratory use only  |  |  |  |  |
| Appropriate clothing (no shorts or sandals) worn in lab |  |  |  |  |
| Lab coats, nitrile gloves, safety glasses are available |  |  |  |  |
| No cloth chairs in labs |  |  |  |  |
| Respirators are provided as needed |  |  |  |  |
| Work areas are clear of clutter and exits are unrestricted |  |  |  |  |
| No food or drink found in labs / signs on refrigerators  |  |  |  |  |
| Signs are in place (USA Chart; Entrance Reqs.) by door/phone |  |  |  |  |
| Used needles are placed in sharps container ( **no recapped needles**) |  |  |  |  |
| Equipment is in good repair & electrically grounded |  |  |  |  |
| Heavy objects are confined to lower shelves |  |  |  |  |
| Combustibles are not stored too close to ceilings and fire sprinklers (18 inches if sprinkler and 24 inches if un-sprinkler). |  |  |  |  |
| Microwaves in labs are labeled “For lab use only” and those outside labs in food consumption areas are labeled “For human food only.” |  |  |  |  |
| Electrical cords are not frayed. |  |  |  |  |
| Ice machines are labeled “Not for human consumption.” |  |  |  |  |
| Up-to-date versions of the Lab Chemical Safety Plan is accessible by laboratory personnel. |  |  |  |  |
| **Chemical Safety** |  |  |  |  |
| Eyewash & showers easily accessible; no obstruction  |  |  |  |  |
| Eyewash & showers up to date on inspection & flushed regularly |  |  |  |  |
| **Chemical Safety Contd.** | **Yes** | **No** | **n/a** | **Comments**  |
| Eyewash logs are up to date |  |  |  |  |
| Eyewash nozzles are covered |  |  |  |  |
| Fume hoods are free of clutter  |  |  |  |  |
| Fume hoods are up to date on inspection |  |  |  |  |
| Vacuum collection system overflow flask & HEPA filters are clean |  |  |  |  |
| All Hazardous chemical containers have appropriate labeling |  |  |  |  |
| Incompatible chemical storage (e.g. acids with bases) |  |  |  |  |
| Prolonged storage of unstable chemicals |  |  |  |  |
| No flammable liquids are stored in regular refrigerators  |  |  |  |  |
| No dry ice stored in refrigerators or cold rooms |  |  |  |  |
| oxygen sensor in confined area where liquid nitrogen is stored |  |  |  |  |
| All compressed gas cylinders are secured and in upright position |  |  |  |  |
| All compressed cylinders are capped when not in use |  |  |  |  |
| Gas cylinders are properly labeled with their content |  |  |  |  |
| Full & empty gas cylinders stored separately & labeled as such  |  |  |  |  |
| All chemical containers are free from cracks and leaks |  |  |  |  |
| Spill control equipment (neutralizers, absorbent pads) are present |  |  |  |  |
| Signs on storage areas are consistent with hazards within |  |  |  |  |
| MSDS list is available for chemicals used and stored in area |  |  |  |  |
| Hazardous or corrosive liquids are not stored above eye level |  |  |  |  |
| **Hazardous Waste** |  |  |  |  |
| Satellite Accumulation Area(SAA) is near where waste is generated |  |  |  |  |
| Maximum SAA storage capacity is not exceeded |  |  |  |  |
| Secondary containers are in good condition; free from cracks or leaks |  |  |  |  |
| All containers are clearly labeled with name, date & contents |  |  |  |  |
| Waste containers are closed at all times unless adding chemicals |  |  |  |  |
|  |  |  |  |  |
| **Biological Safety** | **Yes** | **No** | **n/a** | **Comments** |
| Biohazardous waste containers are labeled properly |  |  |  |  |
| Biohazardous wastes are placed in red bags with proper symbols |  |  |  |  |
| Biohazard signs are posted in labs handling infectious material BSL2> |  |  |  |  |
| Lab coats, gowns, scrubs are used in handling infectious material  |  |  |  |  |
| Respirators are provided where needed |  |  |  |  |
| Disinfectants are available for sanitizing bench tops and spills |  |  |  |  |
| Biological safety cabinet(s) were certified within last year |  |  |  |  |
| **Radiation Safety** |  |  |  |  |
| If radioactive material is present is proper sign posted on lab door |  |  |  |  |
| Radioactive waste is properly marked with radiation symbol |  |  |  |  |
| Radioactive freezer is properly labeled with radiation symbol |  |  |  |  |
| Geiger counter is calibrated |  |  |  |  |
| **Fire and Emergency Safety** |  |  |  |  |
| Exits are clearly marked and free from obstruction |  |  |  |  |
| Telephones are labeled with emergency numbers |  |  |  |  |
| Emergency evacuation routes are clearly posted in hallways |  |  |  |  |
| Emergency exit lights are working and free of obstruction |  |  |  |  |
| Fire extinguishers are properly installed and inspected |  |  |  |  |
| All fire doors are self-closing and kept closed |  |  |  |  |
| **Additional Comments:** |

**APPENDIX B**

**VA Western New York Health Care System Laboratory Closeout Checklist Room#\_\_\_\_\_\_\_\_\_ Principle Investigator\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_/\_\_\_/\_\_\_\_**

**Please check refrigerators, freezers, fume hoods, bench tops, storage cabinets,**

**closet spaces, and shared storage areas for hazardous materials.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Biohazard Waste (human tissues, fluids, pathogens, and rdna):** | **Yes** | **No** | **n/a** | **Comments** |
| all solid waste (human tissues, pathogens, contaminated items) have been placed in an autoclave bag and sterilized by steam sterilization and disposed as solid sanitary waste. |  |  |  |  |
| all liquid waste (blood, fluids, pathogens) have been chemically disinfected (bleach) and disposed into the sanitary sewer. |  |  |  |  |
| all animal tissues have been frozen and picked up for incineration. |  |  |  |  |
| **Equipment** |  |  |  |  |
| refrigerators and freezers have been emptied and cleaned |  |  |  |  |
|  incubators and ovens have been emptied and cleaned |  |  |  |  |
| disinfected all workbenches, instrumentation, and other lab material that may have been contaminated during research. |  |  |  |  |
| removed all biohazard signs from cleaned equipment and laboratory door (afterconfirming with biosafety office or R&D Office). |  |  |  |  |
| **Radioactive Materials** |  |  |  |  |
| contacted the radiation safety officer (RSO) to request a preliminary consultation. |  |  |  |  |
| packaged all materials in approved and labeled waste containers. |  |  |  |  |
| completed radioactive waste cards and attached to containers |  |  |  |  |
| contacted the RSO to request removal of radioactive waste |  |  |  |  |
| returned all inventory sheets to the RSO |  |  |  |  |
| scheduled closeout survey with the RSO |  |  |  |  |
| performed contamination survey, decontaminated and re-surveyed if necessary |  |  |  |  |
| **Radioactive Materials Contd.** | **Yes** | **No** | **n/a** | **Comments** |
| removed all radiation labels and stickers from benches, sinks, hoods, etc. (don’t remove caution - radioactive material sign from entry door). |  |  |  |  |
| checked all shared areas for radioactive materials/waste. |  |  |  |  |
| **Chemicals (Solid, Liquid, Gas)** |  |  |  |  |
| label chemical containers with contents (full chemical name(s) |  |  |  |  |
| close all containers securely to prevent leaks or spills |  |  |  |  |
| segregate incompatible materials |  |  |  |  |
| store flammable liquid containers in flammable storage cabinets until removal |  |  |  |  |
| **Compressed Gases** |  |  |  |  |
| identified compressed gas cylinders and ensured they are labeled |  |  |  |  |
| removed pressure regulators on cylinders and replaced protective valve caps |  |  |  |  |
| return cylinders to the gas supplier (do not leave in lab.) |  |  |  |  |
| **Controlled Substances** |  |  |  |  |
| contact the Narcotic Control Officer to arrange proper disposal and documentation of destruction. |  |  |  |  |
| **Equipment, Lab Furniture, General Safety/Security** |  |  |  |  |
| contact Safety officer for information regarding contaminated equipment |  |  |  |  |
| decontaminated equipment or furniture to be left in lab, including fume hoods, bench tops, and shelves. |  |  |  |  |
| arranged for transfer of ownership and removal of equipment to remain |  |  |  |  |
| arranged for removal of unwanted, broken, or obsolete equipment |  |  |  |  |
| checked all shared areas, freezers, incubators, and cold rooms for hazardous materials/waste. |  |  |  |  |
| returned keys to departmental business office |  |  |  |  |
| returned computers, peripherals, software, data disks to chair/dean or facility manager. |  |  |  |  |
| **Hazardous Waste** |  |  |  |  |
| identify, label, and dispose of hazardous waste through standard disposal service. |  |  |  |  |
| collected and containerized all sharps, needles, razor blades, surgical blades, and glass for disposal. |  |  |  |  |

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| --- |
| **Additonal Comments:** |