DEPARTMENT OF VETERANS AFFAIRS
South Texas Veterans Health Care System
San Antonio, Texas 78229-4404

Research Service Policy Memorandum 16-04

January 4, 2016

Chemical Hygiene Plan (CHP)

1. **PURPOSE:** To educate Research personnel of the hazards associated with the chemicals used within Research Service.

2. **POLICY:** The Research Service maintains a program of educating the employees on a continuous basis and providing protection from health hazards associated with hazardous chemicals in the laboratory. The Service keeps exposure limits below permissible limits and ensures compliance with pertinent Federal, State and local regulations to insure patients, laboratory personnel, visitors, property, and the environment are protected.

3. **SCOPE:** Research personnel are initially and continuously made aware of the hazards of laboratory chemicals to which they may be exposed, by means of a hazard communication program, product labeling, Safety Data Sheets, training, and monitoring compliance of the personnel. This CHP complies with Hazard Communication Plan (HCP). As defined by Occupational Safety and Health Administration (OSHA) 1910.1200, a hazardous chemical is one which is a physical or health hazard. The policy does not apply to the use of consumer use products, articles, food, tobacco, wood and wood products, or pharmaceutical products used with patients.

4. **RESPONSIBILITIES:**

A. **ACOS FOR RESEARCH AND DEVELOPMENT:**

(1) Oversee all phases of the laboratory chemical hygiene plan.

(2) Appoint the Chairman, Research Laboratory Sub-Safety Committee (RLSS) (who will serve as the Chemical Hygiene Officer).

(3) Ensure investigations of incidents or unsafe condition concerning hazardous chemicals and assure prompt action is taken to prevent recurrence.

(4) Ensure development of procedures on the use, storage, spill control and disposal of hazardous chemicals utilized.

(5) Ensure training of employees on safe handling and disposal of hazardous chemicals utilizing the RLSS members and resources of the Industrial Hygienist. NOTE: Chemical Hygiene training and procedures conducted by the affiliate University of Texas Health Science Center San Antonio (UTHSCSA) will also be accepted in STVHCS.

(6) Ensure that hazardous chemicals are substituted, where possible, for less hazardous chemicals to minimize potential exposure and minimize waste.

(7) Maintain a current and detailed inventory of all chemicals within Research Service and provide copies to Safety Office upon request.

The ultimate responsibility for creating a safe environment and for encouraging a culture of safety rests with the Director of the facility, ACOS for Research, Administrative Officer and Principal Investigators.

B. **CHEMICAL HYGIENE OFFICER/CHAIRMAN, RLSS**

(1) Assume functions described in 29 CFR 1910.1450.

(2) Assist in training employees on the safe handling and disposal of hazardous chemicals, utilizing the resources of the STVHCS Safety Office.

(3) Ensure hazardous chemicals are stored, labeled, and disposed of in compliance with Federal, State and local regulations.

(4) Insures each lab provides and maintains a current inventory of all chemicals including biohazards and/or potential infectious agents and provide copy when requested.

(5) Insures the RLSS investigates incidents or unsafe conditions concerning hazardous chemicals and assure prompt corrective action is taken to prevent recurrence.

(6) Ensure Subcommittee performs monthly inspection of the Research Service and compliance with the Safety Program.

(7) Ensure the Chemical Hygiene Plan is reviewed annually by the Safety Subcommittee for any possible changes or updates. Minutes should reflect review.

C. **EMPLOYEES & RESEARCHERS:**

(1) Read and comply with this policy and all other service and hospital policies pertaining to chemical hazards.

(2) Promptly report unsafe conditions or unsafe use of hazardous chemicals to their supervisors and the Administrative Officer for Research.

(3) Attend all required training classes at the VA or UTHSCSA to stay in compliance with relevant rules and regulations.

(4) Take all necessary safety precautions pertaining to their job duties.

(5) Wear the appropriate personal protective equipment when at risk for injury.

(6) Inform their immediate supervisor of any injuries or exposures.

(7) Report to Occupational Health Clinic or UTHSCSA Employee Health of any change in their health status if there is a possibility it may be work-related. Also a courtesy reporting to their supervisor can be helpful in reducing further injury to other personnel.

(8) Report all chemical spills and accidents to supervisor and chemical hygiene officer. Chemical Hygiene Officer will notify Green Environmental Management System (GEMS) Coordinator and or Industrial Hygienist.

5. **ACTION:**

A. GENERAL PROCEDURES FOR WORK WITH LABORATORY CHEMICALS

(1) Eating, drinking, and chewing gum are prohibited in areas where laboratory chemicals are present. Hands should be washed before conducting these activities. Smoking is not permitted in any research area and is limited to smoking areas designated by the hospital.

(2) Food/drink is not permitted in technical work area, including office space inside the laboratory.

(3) It is strongly advised that contact lenses are not worn in the laboratories unless splash proof goggles are worn. Contact lenses, especially soft contact lenses, will absorb certain chemicals and in addition constitute a hazard with splashes to the eyes.

(4) Wash hands before leaving laboratory technical area.

(5) Mouth pipetting is prohibited.

(6) Use of a fume hood or wearing of face shields and gloves and/or eye protection when handling hazardous substances is required.

(7) Hair should be secured back and off the shoulders in such a manner to prevent contact with hazardous chemicals and contaminated materials.

(8) Safety Data Sheets (SDS): The responsible supervisor (Principal Investigator) or researcher will maintain a current set of printed Safety Data Sheets for all of the chemicals on the room's inventory in a binder conspicuously identified as containing SDS. Remove SDS for chemicals no longer used/nolonger on the inventory. Arrange the SDS in sequence with the inventory. For rooms that have more than 1 each SDS, tab the SDS binder alphabetically. Place the SDS binder in a SDS binder holder or "Worker Right to Know Center" (available from Lab Safety Supply or similar vendors) mounted or shelved in a conspicuous location in the room, or in the hallway immediately outside the room entry. (See Appendix A for a list of items/chemicals that need no SDS according to OSHA).

(9) Avoid practical jokes or other behavior which might confuse, startle, or distract other laboratory personnel.

(10) Keep work area clean and uncluttered, with chemicals and equipment being properly labeled and stored, clean up the work area on completion of task or at the end of each day. This includes cleaning bench tops/countertops, turning off air, vacuum and gases if used.

(11) Each lab will dispose of glassware that is chipped or broken in a large red sharps container and clearly marked "broken glass". (NOTE: paper with the words "broken glass" should be taped to the container).

(12) Consult Safety Data Sheets (SDS) when performing new procedures and prepare appropriate protective procedures. Also consult SDS for proper disposal procedure. If any questions, consult with STVHCS Industrial Hygienist or GEMS Coordinator.

(13) DO NOT accept delivery of chemicals unless a SDS is on file, accompanies it or one can be obtained immediately after returning to the lab to store the chemical. Go to: http://vaww.ceosh.med.va.gov/ceosh/SDS.shtml if you have VA Intranet access.

(14) Do not centrifuge uncovered specimens.

(15) Chemicals and other hazardous substances will not be routinely stored in hoods.

(16) The wearing of open toe sandals or shoes is prohibited in the laboratory.

(17) Hallways may not be used as storage areas. Access to emergency exits, emergency equipment, or utilities control should never be blocked.

(18) Needles/sharps

(a) Precautions will be taken by all hospital personnel when there is the possibility of employee skin or mucous membrane exposure to any patient's non-intact skin, mucous membranes, blood or body fluid, or applicable body fluids as defined in 2 b.

(b) Fluids to Which Standard Precautions Apply: In accordance with Centers for Disease Control Guidelines, standard precautions shall apply to blood, semen, vaginal secretions, CSF, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, amniotic fluid and all fluids contaminated with visible blood from all patients. These precautions do not need to be applied to feces, nasal secretions, sputum, sweat, tears, urine, or vomit unless visible blood is present.

(c) Extreme caution should be used when handling needles and syringes to avoid autoinoculation.

(d) Needles should not be bent, sheared, replaced in the sheath or removed from the syringe following use. Needle and syringe should be immediately placed in a puncture resistant container. Containers are procured from a contracted vendor by Chemical Hygiene Officer, AO or the AO's representative, for distribution to the labs. Full sharps containers will be placed in a red plastic-lined biohazard box located in **Cold Room 2** (CTR-2) for removal by the contracted vendor.

B. **PROTECTIVE APPAREL AND EQUIPMENT:** Personal Protective Equipment (PPE) includes gloves, goggles, face shields, aprons, fluid impervious gowns, masks, respirators, and safety shoes. The equipment must be available for situations when an unexpected exposure to chemical substances, physical agents or biological materials could have serious consequences. The STVHCS Safety Office can advise on the acceptability of PPE prior to purchase.

(1) **Eye:**

(a) Chemical splash goggles and/or face shields, rather than safety glasses should be used when pouring any hazardous chemicals or hazardous waste as they provide the best protection against splashes.

(b) Protective eyewear must be available in all areas where hazardous substances are utilized.

(c) Protective eyewear should be easy to clean and disinfect. Eyewear should be kept clean and maintained properly (i.e. not hung on a hook by the strap, etc.).

(d) For those employees who wear glasses, goggles must fit over the glasses.

(2) **Gloves:**

a. Gloves (non-latex/powder free) will be used by all lab employees.
b. Other types of gloves may be purchased and used by lab personnel, these include:
   i. Neoprene, Nitrile, Polyethylene, Poly (vinyl alcohol), Poly (vinyl chloride), Polyurethane, 4H or Silvershield, Viton.
   ii. Gloves should not be used beyond the expiration date.
   iii. Do NOT wear gloves outside the laboratory, to avoid contamination of surfaces used by unprotected people.

NOTE: Some spill kits are packaged with latex gloves; when available exchange these latex gloves with non-latex gloves.

(b) Employees are required to wear gloves when handling all patient or animal specimens.

(c) Special acid resistant gloves should be provided in all areas utilizing acids. Principal investigators should consider if specially made gloves are required in regards to the work conducted.

(d) Appropriate protective gloves should be used whenever hand contact with formaldehyde is possible, latex examination gloves are too fragile.

(3) **Other personal protective equipment:**

(a) Rubber, acid-resistant aprons should be worn when pouring concentrated chemicals.

(b) Respirators must be provided in areas where there is a possibility that the air may become contaminated with excessive concentrations, chemical fumes, harmful dusts and mists and microorganisms. Surgical masks do not provide adequate protection. Respirators are not to be provided without consultation and approval of the Industrial Hygienist.

1. Respirators must be chosen as to the hazard for which they are intended.

2. Adequate training must be provided for all personnel who may use the respirator (N95 or better). The Industrial Hygienist administers this program.

C. SPECIAL LABORATORY PROCEDURES:

(1) **Compressed Gases:**

(a) Cylinders must be secured to walls or countertops at all times so they cannot fall.

(b) Valve safety covers should be left on until pressure regulators are attached.

(c) Cylinders must be labeled clearly with name of contents and hazards.

(d) Hand trucks or dollies with a chain or strap attached must be used when moving cylinders.

(e) The use of oil, grease, or lubricants on valves is prohibited.

(f) Do not attempt to repair damaged cylinders or force frozen cylinder valves.

(g) SDSs should be obtained and be available for all compressed gases being used.

(h) Cylinder tags are available from Chemical Hygiene Officer or GEMS Coordinator.

(2) **Flammable Gases:**

(a) No more than two cylinders should be strapped/affixed together. However, several instruments or outlets are permitted for a single cylinder. Goggles are recommended.

(b) When more than one cylinder of a highly flammable gas is to be used in one room, specific approval by STVHCS Chief of Safety must be obtained.

(c) Secured cylinders (full or empty) can be stored in the laboratory; however, only three cylinders may be kept in the laboratory.

(d) Valves on all flammable gas cylinders shall be shut off when the unit is unattended.

(3) **Radioisotopes**

(a) Wear lab coats or other protective equipment (safety goggles, gloves) at all times in areas where radioactive materials are utilized. The purpose is to cover/protect the skin of the arms and street clothing and reduce the risk of skin contamination.

(b) Wear personnel dosimeter when working with radioactive material.

(c) Wear disposable gloves at all times; preferably wear two pairs of disposable gloves.

(d) In the event of a spill, monitor hands and clothing for contamination before leaving the area (call the Safety Office at 1-4035).

(e) Non-porous absorbent lab mats are to be used on all work benches, trays, and other work surfaces where radioactive materials are handled. These mats will be replaced as necessary in those areas that are used regularly.

(f) Two side arm flasks, one used as a trap to prevent radioactive contaminates and other contaminates from being suctioned into vacuum lines, and a one-way vacuum filter will be used on all hospital vacuum lines.

(g) Radiation Safety Office should be contacted for the disposal of liquid wastes if greater than 0.5 uCi.

(h) Dispose of solid radioactive wastes with Radiation Safety Office personnel.

(i) Pipetting with mechanical devices only. NEVER pipette radioactive solutions by mouth.

(j) Confine radioactive solutions in covered containers or shielded containers plainly identified and labeled with name of compound, radionuclide, date, and activity and radiation level if applicable.

(k) A plastic lined metal or plastic can labeled "Radioactive Material" or "Radioactive Waste" will be located in all laboratories where radioactive experiments are performed. When more than one

room is assigned to an investigator, then radioactive waste can be combined and stored in one lab. At the update of this policy, lab S204 is the only authorized room where small quantities of radioactive waste may be poured down the sink. For larger amounts contact the Radiation Safety Officer for approval.

(l) Double contain radioactive liquids and liquid waste.

(m) Disposal of food or candy wrappers and soft drink or coffee cups in laboratory trash containers where radioactive experiments are conducted is prohibited.

(n) A log is kept of the amount of radioactivity stored and used in procedures.

(o) A permanent record will be kept of the weekly survey results, including negative results. The record will include:

1. Location, date, and type of equipment used.

2. Name of individual conducting survey.

3. Drawing of area surveyed, identifying relevant features such as active storage areas, active waste areas, etc.

4. Measured exposure rates, keyed to location on drawing if required.

5. Detected contamination levels keyed to location on drawing.

6. Corrective action taken in the case of contamination or excessive exposure rates, reduced contamination levels or exposure rates after corrective action, and any appropriate comments.

7. Action levels at which corrective action must be taken: Skin decontamination of radioisotope spills in the chemical laboratory.

a. Wash contaminated area or areas thoroughly with mild soap and large quantities of water.

b. Special attention should be directed to areas between the fingers and around the fingernails.

c. Rinse thoroughly and repeat until monitoring indicates a background level.

d. If the above steps are not sufficient, scrub with a soft brush using a mild soap with a heavy lather and tepid water. Use only light pressure on brush, do not bend bristles or erode skin.

e. Rinse thoroughly and monitor.

8. Notify Radiation Safety at earliest opportunity: More detailed information concerning radioisotope procedures may be found in the STVHCS Radiation Safety Handbook (available in the Radiation Safety Office, Room K-203, ext. 14003

(4) **Caustic Materials:**

(a) If quantities of acids or alkalis are being used, use a shield or barrier of some sort so that breaks and spills can be controlled. Spill cleanup materials are located in Room V203.

(b) Wear aprons, gloves, and eye protection when handling highly corrosive materials as recommended on SDS.

(c) Do not mouth pipette.

(d) Do not sniff reagents. Sniffing is NOT recommended for any chemical for identification.

(e) Dilution: Use great care and add reagents SLOWLY. Always add acid to water. Allow acid to run down the side of the container and mix slowly by gentle rotation. Avoid overheating.

(f) Transport using heavy plastic or glass bottles as carriers.

(5) **Toxic Chemicals:**

(a) Safety Data Sheets will state the recommended limits or OSHA-mandated guidelines for exposure to toxic chemicals.

(b) When an OSHA permissible Exposure Limit (PEL) value for a chemical is less than 50 ppm or 100mg/m3, then the person using the chemical should conduct the work in an operating fume hood. If a fume hood is not available, in accordance with the OSHA respirator requirements (29 CFR 1910.134), a proper respirator will be used by the operator and all those who could be potentially affected by the exposure.

(c) Whenever handling of toxic substances with moderate to large vapor pressures is likely to exceed air concentration limits, laboratory work with such liquids and solids will be conducted in a fume hood.

(d) Toxic compounds are stored according to the nature of the chemical, with appropriate security employed where necessary.

(e) "Poison Control Network" telephone number is posted **(1 800 222-1222).**

(6) **Reactive Chemicals:**

(a) Reactivity information is sometimes given in manufacturers' SDSs and on labels. A reactive chemical is one which is either (i) ranked by the NFPA as 3 or 4 for reactivity; (ii) fits the OSHA definition of unstable in 29 FR 1910.1450; (iii) or is known or found to be reactive with other substances.

(b) Reactive chemicals will be handled with all proper safety precautions including segregation in storage, prohibition on mixing of even the smallest quantities with other chemicals without prior approval, and the use of appropriate personal protection equipment.

(7) **Formaldehyde:** OSHA issued a revised standard for the exposure to formaldehyde in 1987 (29CFR 1910.1048). The revision requires evaluation of Pathology, Anatomy and Histology laboratories and employees working in these areas. Depending upon results of the monitoring, the revised standards may require periodic monitoring, signage, implementation of engineering and work practice controls, respiratory protection, medical surveillance, record keeping, and employee training. Refer to Formaldehyde Policy 001-10-43.

(a) The STVHCS Industrial Hygienist will perform exposure monitoring periodically to determine exposure levels of formaldehyde to employees. The permissible exposure level for an 8-hour

time weighted average (TWA) is 0.75 parts per million (PPM), and the short-term (15-minutes) exposure level is 2.0 PPM (OSHA 29CFR1910.1048).

(b) The employer must assure that no employee is exposed to an airborne concentration exceeding .75 part formaldehyde per million parts air as an eight hour TWA. To be accomplished by:

1. Engineering controls, i.e., hoods, ventilation changes, etc.

2. **Respiratory protection.**

(c) Employees at risk of potential overexposure to formaldehyde are monitored by badge on an annual basis when exposure has been shown to exceed the standard.

(d) Monitoring is to be done by the Industrial Hygienist who will review and report results within 10 working days to the ACOS for Research.

(e) All detectable results must be shared with the employee affected and if an overexposure has occurred the Employee Heath physician. Any overexposure will be medically evaluated by an employee health or triage physician.

(f) Written plans must be implemented to reduce exposure.

(g) Areas identified as exceeding permissible exposure limits must be identified with following warning:

1. DANGER: Irritant and possible cancer hazard.

2. FORMALDEHYDE - AUTHORIZED PERSONNEL ONLY

(h) Biological samples preserved in formaldehyde will NOT be autoclaved.

(8) **Xylene**

(a) Exposure to xylene is not to exceed 100 ppm calculated as an 8 hour time weighted average (TWA).

(b) Exposure is not to exceed 150 ppm per 15 minute short term exposure limit STEL.

(c) Any level exceeding recommended exposure requires medical evaluation by an employee health or triage physician.

(d) Employees at risk of exposure are monitored by badge on an annual basis when exposure exceeds the standard.

(e) Monitoring is done periodically by the STVHCS Industrial Hygienist.

(f) Results will be reviewed and submitted to the ACOS for Research by the Industrial Hygienist. The employee will be notified in writing by supervisor within 10 days of results of dosimetry.

(g) Written plans must be implemented to reduce exposure if there is any indication of overexposure.

(9) **Carcinogens:** Use of carcinogens requires the following:

(a) Designation of specific work areas with restricted access.

(b) Listing of personnel authorized to work in the area

(c) Inventory of types of reagents on hand.

(d) Personnel must be trained in safe handling procedures for the carcinogenic chemical.

(e) Records of exposure must be maintained.

(f) Procedures for monitoring, storage, decontamination, disposal and emergency procedures must be established.

(g) Medical evaluation is required in the event of any skin contact with a carcinogenic agent.

(h) Protective clothing should be used and cleaned regularly.

(i) Hand washing is required immediately after handling.

(10) **Biohazards:**

(a) Designation of specific work areas with restricted access.

(b) Listing of personnel authorized to work in the area.

(c) Inventory of types of biohazards on hand.

(d) Personnel must be trained in safe handling procedures for biohazards.

(e) Records of exposure must be maintained.

(f) Procedures for monitoring, storage, decontamination, disposal and emergency procedures must be established.

(g) Protective clothing must be used (minimally, disposable gloves, masks (N95). (NOTE: N95 mask must be approved for use and fit tested by a qualified person)

(h) Hand washing is required immediately after handling.

(i) The STVHCS Infection Control personnel (ext.5108) are available for consultation regarding any biohazard.

(11) **Perchloric Acid:**

(a) Use of goggles or other protective eyewear is mandatory.

(b) Always transfer acid over a basin in the sink.

(c) Heating of perchloric acid must be performed in fume hood.

(d) Perchloric acid is to be checked monthly for discoloration; if discoloration is noted, the acid should be discarded following methods in Safety Data Sheets. Any excess of perchloric acid will be done in consultation with the GEMS Coordinator.

(12) **Picric Acid**: will be handled in accordance with VA policy memorandum #007-15-14.

(13) **Peroxide Forming Materials** - handle in accordance with VA Policy memo #007-15-13.

(14) **Mercury** - Must be handled in accordance with VA policy memorandum #007-16-31.

(15) **Inhalation anesthetics (Isoflurane)**: Isoflurane must be used with a scavenging system that exhausts out of room. Personal exposure monitors are available to all personnel working with Isoflurane. Monitors and results maintained by Chemical Hygiene Officer or designated representative.

D. PROCUREMENT:

(1) Before ordering any new types of hazardous material (items not already on your chemical inventory), contact the Safety Office (GEMS Coordinator) and be prepared to provide Name/Serial Number, Manufacturer, Safety Data Sheet (SDS), typical order quantity, how much you plan to use per unit time (per day, week, month, year as appropriate), where it will be stored (room # and specific hazmat storage location within the room, e.g., "Flammable Storage Locker"), and if any waste will be generated, how the waste will be handled.

(2) When ordering chemicals, SDS must be requested and listed as line item on the order. Upon arrival the lab technician must place a copy of the SDS in the lab SDS binder. SDSs are also available on intranet and internet sites http://vaww.ceosh.med.va.gov/ceosh/SDS.shtml

(3) Order minimum quantities that are consistent with the rate of use.

(4) Order only what will be used within a year or less.

(5) If possible, order reagents in polyethylene bottles or plastic coated glass bottles to minimize breakage, corrosion and rust.

(6) Every effort should be made to find less hazardous substitutes for more hazardous chemicals, provided a suitable substitute is available

Prior to ordering additional chemicals for your laboratory ask the following:

1. Is the material already available from another lab within Research or from a surplus stockroom (V203 safety cabinets)?
2. What is the minimum quantity that will suffice for current use?
3. What is the maximum size container allowed in the labs where the material will be used and stored? Is there room in your storage cabinets for the size of container you wish to purchase?
4. Can the chemical be managed safely when it arrives and does it require special storage?
5. Will the quantity ordered affect compliance with the U.S. Department of Homeland Security Chemical Facility Anti-Terrorism Standard (CFATS)? http://www.dhs.gov/chemical-facility-anti-terrorism-standards. Appendix A: Chemicals of Interest List: http://www.dhs.gov/appendix-a-chemicals-interest-list
6. Will this chemical produce a new category of waste? This may be difficult for the GEMS Coordinator to get rid of through the designated waste disposal vendor.

STORAGE: When not in immediate use during a work day, store all hazardous material in an appropriate container or storage location. Hazardous materials that are filled in a process/machine designed for their storage are considered properly stored. Store all hazardous materials in closed cabinets/enclosures/refrigerators/freezers that are clearly marked/labeled as containing hazardous material. If the storage cabinet/enclosure/refrigerator/freezer does not have intrinsic secondary containment, provide secondary containment within the storage cabinet/enclosure/refrigerator/freezer using plastic containers.

NOTE: Secondary containment is simply placing a container inside another container. For example, placing a ceramic or plastic basin under another container to account for potential leaks. All chemicals inside cabinets and are liquid should have secondary containment if room allows.

Chemicals will be stored in cool, dry areas at temperatures between 67F and 84F, unless the manufacturer notes otherwise. Storage areas should be constructed so that shelving is fixed securely to the floor or wall and should be away from direct sunlight, high heat and humidity, and ignition. Access to the storage area should be limited to authorized personnel only.

Chemicals will be stored in properly labeled containers with special attention given to hazard warnings. These warnings will alert employees using the chemicals not to store incompatible materials in the same area. Chemicals need to be stored by their potential hazard groups, and alphabetically. These hazard classes' areas follow: Health Hazard, Carcinogen, Compressed Gas, Corrosive, Flammable, Moderate Poison, Non-Hazardous, Radioactive, Severe Poison, Water Reactive and Oxidizers.

Large volumes of flammables must be stored in special storage areas. Water reactive chemicals need dry storage. Strong oxidizers will be separated from other chemicals. Compressed gas cylinders will be secured and supported.

Each employee/researcher should read the manufacturer's or supplier's directions before using any product, and the possible hazards (both physical and health hazards) of the product.

WARNING: ALWAYS STORE NITRIC ACID ALONE – unless the designated storage cabinet has a separate space for storage.

(1) Corrosives: Store all corrosive material in a corrosive storage locker (or specifically designed from for corrosive storage that has been approved by the Safety Office), separate from other chemicals.

(2) Store all acids/acidic material in an "Acid" storage locker or specifically designed room for acid storage that has been approved by the Safety Office, separate from other chemicals.

(3) Oxidizers: Store all oxidizers in a cabinet/locker labeled "Oxidizers," and separate from other chemicals.

(4) Do NOT store any hazardous material in a lab hood unless specifically directed, in writing, by the Safety Office.

(5) Do NOT store any hazardous material above 5 feet from the floor, unless the shelves have glass doors. Shelves with glass doors may be used to store bottles of chemicals (up to 1 kg of dry power or crystalline based) on any shelf within the lab. Liquid chemicals not exceeding 1 liter should not be stored

higher than 5 feet. Smaller quantities of liquid chemicals (i.e. less than 500 mL) may be stored up to heights not exceeding 70 inches unless they are stored behind glass doors. Use step ladders if needed.

(6) Do NOT stack hazardous material in a way that might cause it to fall.

(7) Store all flammable and combustible material in an NFPA approved flammable storage locker, explosion proof refrigerator/freezer, or specifically designed room for flammable storage that has been approved by the Safety Office, separate from other chemicals. If you plan to store more than a total of 2 gallons of flammable and combustible liquid in any single room, contact the Safety Office to calculate the NFPA 45 maximum allowable storage volume for the room.

(8) Organize chemicals first by COMPATIBILITY; then arranged the compatible groups alphabetically.

STORAGE DON'TS

a. **Do NOT** place heavy materials, liquid chemicals, and large containers on high shelves.
b. **Do NOT** store chemicals on tops of cabinets.
c. **Do NOT** use fume hoods as long-term storage for hazardous chemicals.
d. **Do NOT** store chemicals on the floor, even temporarily.
e. **Do NOT** store items on bench tops and in laboratory chemical hoods, except when in use.
f. **Do NOT** store chemicals on shelves above 70 inches (review (5) from previous page.
g. **Do NOT** store chemicals with food or drink.
h. **Do NOT** store chemicals in personal staff refrigerators.
i. **Do NOT** expose stored chemicals in direct heat or sunlight or highly variable temperatures.
j. **Do NOT** use stairways and hallways as storage areas. Access to exits, emergency equipment, and utility controls should never be blocked

f. **FLAMMABLES/COMBUSTIBLES:**

(1) Quantities of three liters or more must be stored in a safety cabinet. Smaller one-shelf flammable cabinets should be requested if required within lab.

(2) Small quantities (working amounts) may be stored on open shelves; however, bulk storage (5 gallons or more) must be stored in an approved flammable storage cabinet.

(3) **Ether. Use of ether within labs is not permitted.**

(4) Store flammable liquids appropriately. Flammable materials may be stored in a refrigerator that is explosion proof.

(5) The transfer of flammables from one metal container should be preceded by electrical bonding in order to avoid a static spark that may result from pouring the solvent.

(6) No flammable will be stored on the floor.

g. **ACIDS:**

(1) Quantities of three liters or more of acids must be stored in the acid safety cabinet within the lab or in the acid/corrosive cabinet in V203, using secondary containment.

(2) In addition to required chemical labeling, a label must be placed on container indicating investigator's name, date placed in storage, and the name and number of the contact person.

h. **PERCHLORIC ACID:**

(1) No organic materials should be stored in the hood containing perchloric acid.

(2) Do not allow perchloric acid to come in contact with strong dehydrating agents (concentrated sulfuric acid, anhydrous phosphorous pentoxide, etc.)

(3) No more than five five-liter bottles are to be stored in the laboratory, and none stored on the floor. Must get approval from the Safety Office (call 1-4040).

(a) Water-Reactive Chemicals - Chemicals are kept in a cool and dry place

(b) Oxidizers - Oxidizers are stored away from flammables, combustibles, and reducing agents (e.g. zinc, alkaline metals)

(c) Toxic Compounds - Toxic compounds are stored according to the nature of the chemical, with appropriate security employed where necessary.

SUGGESTED STORAGE PATTERN

INORGANICS	ORGANICS
Metals, Hydrides	Acids, Anhydrides, Peracides
Halides, Halogens, Phosphates, Sulfates, Sulfites, Thiosulfates	Alcohols, Amides, Amines, Glycols, Imides, Imines
Amides, Azides, Nitrates (except Ammonium nitrate), Nitrites, Nitric Acid	Aldehydes, Esters, Hydrocarbons
Carbon, Carbonates, Hydroxides, Oxides, Silicates	Ethers, Ethylene oxide, Halogenated hydrocarbons, Ketenes, Ketones
Carbides, Nitrides, Phosphides, Selenides, Sulfides	Epoxy compounds, Isocyanates
Chlorates, Chlorites, Hydrogen Peroxide, Hypechlorites, Perchlorates, Perchloric acide, Peroxides	Azides, Hydroperoxides, Peroxides
Arsenates, Syanates, Cyanides	Nitriles, Polysulfides, Sulfides, Sulfixides
Borates, Chromates, Manganates, Permanganates	Cresols, Phenols
Acids (except Nitric Acids)	
Arsenic, Phosphorous, Phosphorous, Pentoxide Sulfer	

Suggestion for storage groups:

A	Compatible Organic Bases	G	Not intrinsically reactive or flammable or combustible
B	Compatible Pyrophoric & Water-Reactive Materials	J	Poison Compressed Gasses
C	Compatible Organic Acids	K	Compatible explosive or other highly unstable material
D	Compatible Oxidizers including Peroxides	L	Non-reactive flammable and combustible, including solvents

E	Compatible Inorganic Acids NOT including Oxidizers or Combustible	X	Incompatible with ALL other storage groups

Storing Highly Reactive Substances

1. Prior to ordering higher reactive assess the smallest amount needed and if there is safe storage for that amount.
2. Label, date and inventory all chemicals as soon as they are received into the laboratory. The label should state "DANGER! HIGHLY REACTIVE MATERIAL!"
3. DO NOT open a container of highly reactive material if it is past its expiration date.
4. All highly reactive materials should be reviewed annually to determine if the chemical is needed.
5. As a rule ALL chemicals should be checked for expiration dates. If the chemical has expired coordinate pick-up with the GEMS Coordinator.
6. Store highly reactive liquids in trays large enough to hold the contents of the bottles.
7. Store perchloric acid bottles in glass or ceramic trays.

Storing Highly Toxic Substances

Take the following precautions when storing carcinogens, reproductive toxins and chemicals with a high degree of acute toxicity:

1. Store chemicals known to be highly toxic in ventilated storage in unbreakable, chemically resistant secondary containment.
2. Keep quantities at a minimum working level.
3. Label storage areas with appropriate warning signs, such as:
   "CAUTION! REPRODUCTIVE TOXIN STORAGE!" or
   "CAUTION! CANCER-SUSPECT AGENT STORAGE!"

Toxic substances should be segregated and locked from non-compatible materials.

Maintain an inventory of all highly toxic chemicals. Keep records of acquisition, use, possession, and disposal. http://vaww.ceosh.med.va.gov/

NOTE: When purchasing large quantities of chemicals or toxins that are stored at STVHCS it is required that the lab technicians keep the acquisition record (Purchase Order Form) on file for auditing purposes.

NOTE: In the event a specific type of chemical storage cabinet is not available another color chemical storage cabinet may be used if there is a sign clearly labeling that cabinet with the chemical category. Categories cannot be mixed. For example, a yellow "flammable" cabinet may be used for "corrosive" storage as long as it is clearly and legibly marked on both doors. Only the types of chemicals in a specific category may be stored in a cabinet.

When funds are available, Research Service will purchase chemical storage cabinets upon request. These cabinets are the property of Research Service and will not be allowed to be transferred to UTHSCSA.

I. **ENVIRONMENTAL MONITORING:** The Industrial Hygienist (IH) is responsible for coordinating routine and non-routine air monitoring to minimize exposure to potentially hazardous materials, including irritating odors/fumes of unknown origin. Personnel should notify

the IH of potential hazards. The following are routinely monitored (*monitoring requested by Research Service):

Formaldehyde *	Ethylene oxide	Mercury
Nitrous oxide	Waste anesthetic gases	Asbestos
Xylene*	Toluene*	

J. HOUSEKEEPING AND MAINTENANCE:

(1) Housekeeping

(a) Floors – EMS is responsible for routinely cleaning all floors; this includes sweeping, mopping and buffing as needed.

(b) Bench tops and other work surfaces such as fume hoods and laminar flow hoods – lab personnel are responsible for daily cleaning. Chucks or other absorbent material may be used, but must be exchanged with a clean one when contaminated with *any chemical* whether it's considered harmful or not.

a. Telephones - should be routinely disinfected by the user.
b. Never obstruct access to exits. Emergency equipment such as a fire extinguisher and safety showers should be operational and unobstructed.
c. Store coats, bags, and other personal items in an area away from laboratory work.
d. Keep drawers and cabinet doors closed when not in use.
e. Proper label all chemicals, including transfer vessels with the FULL CHEMICAL NAME, MANUFACTURER'S NAME, HAZARD CLASS AND OTHER SPECIAL WARNINGS!
f. When storing chemicals ensure the labels face to the front so they can be read. Keep all containers closed when not in use.
g. Secure all gas cylinders to the wall or casework.
h. Return all chemicals and equipment to its designated area. DO NOT leave chemicals out on countertops.
i. Keep the work areas clean, including floors. Dust surfaces often.
j. Clean dirty glassware immediately after use.
k. Dispose of broken glass in the large red plastic sharps container.

NOTE: *EMS staff will clean empty labs upon request. This includes floors and bench tops. EMS will not clean the bench tops of active labs due to the potential of chemical reactions initiated by the cleaning agents they use and the chemical residue left behind by lab workers.*

K. MAINTENANCE:

(1) **Routine equipment maintenance** - Equipment is maintained by a service contract with the vendor/manufacture who sold the equipment.

(2) **Hoods** – must be inspected and certified on an annual basis. Hoods without current certification may not be used and should be labeled as "*Out of Use*" until officially certified. The inside of hoods should be routinely cleaned with a HEPA filter vacuum cleaner and wiped down with a disinfectant typically used on disinfecting hoods, i.e. 70% Isopropyl Alcohol is the minimum strength to be used. Some hoods may require ultraviolet lighting to maintain a clean environment. Ultraviolet lighting may be purchased separate from the biological safety cabinet or hood system. In some cases Research Service will purchase this item at no cost to the principal investigator.

Fume Hoods

Hoods should be located in the laboratory after considering the effects of the location of general ventilation intake and exhaust ducts and employee traffic. All exhausts on the roof must be labeled in accordance with National Fire Protection Association Standard (NFPA) 99.

a. Adequate and continuing performance of laboratory fume hoods and biological safety cabinets are essential to employee health protection. These hoods are used to isolate toxic or hazardous materials, biological agents and to protect laboratory personnel during procedures where vapors or aerosols will be generated.

b. These hoods will not be used to store excess volatile or hazardous materials, unused equipment or supplies or to dispose of hazardous materials. The inside of the hood area will not become congested. Other laboratory equipment will be kept at a reasonable distance from the front of the hood.

c. A laboratory hood with 2.5 linear feet of hood space per person should be provided for every two workers who spend most of their time working with hazardous materials. Each hood should have a continuous monitoring device to verify adequate airflow. Hood face velocities should be 60-150 feet per minute (fpm) with the sash open to the approved/marked height. Sash stops shall be installed when the face velocity requirement cannot be met with the sash fully open. The minimum static pressure for each hood shall be established and marked on the pressure gauge, and verified before using the hood. Operations shall not be performed in hoods with less than the required minimum stated pressure. Hood performance is to be evaluated upon installation, annually thereafter, and whenever modifications are made.

d. Sash height should be labeled to show the closure point level where the desired airflow is achieved. This level should be maintained while working with hazardous chemicals inside the hood.

e. Fume hood performance should be thoroughly evaluated and documented periodically for proper airflow in accordance with fume hood certification standards. All fume hoods and biological safety cabinets will be tested and certified at least annually, and will be checked between certifications by the Industrial Hygienist and/or Administrative Officer for Research or his/her designee. HEPA (High Efficiency Particulate Air) filters will be replaced annually and more frequently where necessary. Engineering personnel performing maintenance or repair on these devices will contact the Research Service Administrative Officer for authorization prior to entering the hood. Measures in place to assure the proper functioning of laboratory hoods and other protective equipment should be described.

f. Inoperative hoods awaiting repair will be posted with the notice "Out of Service." Any hood not passing inspection will be closed immediately and posted accordingly until repair work is completed and the hood is certified. Laboratory personnel will notify Research Administration/Administrative Officer of any fume hood or biological safety cabinet that has failed or is suspected of having air flow problems.

(3) **Eye wash fountains:** Weekly – Lab personnel must flush, recap, and annotate the eyewash log weekly for each eyewash in the lab or in the hall outside the lab. This should be completed on the same day of the week every week. Work orders should be submitted for repairs to the Research Administration office at ext. 1-6904. Eyewash log will be checked during monthly safety committee inspections and violations recorded. Read the instructions at the bottom of the annual eyewash calendar log.

L. **INSPECTIONS:**

(1) **Semi-annual** - Safety Office will conduct semi-annual inspections.

(2) **Monthly** - Research Safety Subcommittee members will perform inspections.

(3) **Annual** - STVHCS Safety Committee reviews and evaluates effectiveness of Research Safety Program.

(4) **Periodic** – Administrative Safety rounds, VISN safety inspections, NRC visits

(5) **Emergency drench-type showers** - Safety Office will inspect monthly.

(6) **Fire extinguishers -** Safety Office will inspect all fire extinguishers monthly.

M. **MEDICAL PROGRAM:**

(1) **Routine Surveillance** Employee Health and/or Safety Service administers the surveillance program as outlined by OSHA regulations, for all VA employees who handle or are exposed to hazardous materials. The following are currently monitored by Employee Health and/or Safety Service when an overexposure is shown:

(a) Formaldehyde

(b) Asbestos

(c) Anticholinesterases/insecticides

(d) Chemotherapeutic agents

(e) Ethylene oxide

(f) Nitrous oxide

(g) Noise

(h) Ionizing radiation

(i) Bloodborne pathogen exposure

(2) **Pregnancy Surveillance**: Supervisors shall inform female employees of child-bearing age about reproductive hazards in the laboratory to ensure safety of pregnant employee and her unborn child. Pregnant employees shall notify their supervisor as soon as the pregnancy is known. SDS should be consulted for special precautions to limit unnecessary exposure to the unborn child and change chemical

reagent to a less toxic one when possible. Pregnant employees are encouraged to contact Industrial Hygienist and/or Radiation Safety office for additional information and evaluation of their work environment relative to the individual's exposure.

N. **EMERGENCY FIRST AID:**

(1) **Eye**

(a) In the event of a chemical splash to the eyes, ask co-workers to help you wash the eyes thoroughly. Lift eye lids to avoid trapping of chemicals under eyelids. Flush with water for 15 minutes.

(b) Seek medical attention immediately.

(c) Report accident to immediate supervisor.

(d) Supervisor should initiate "Report of an Accident" and CA-1 in the VISTA/DHCP ASISTS accident database, information printout to the Research Administrative Officer.

NOTE: *Eyewash stations must be within 10 seconds from the hazard or contamination area and must be easily accessible and unobstructed for ease of access and use.*

MAINTENANCE: The American National Standards Institute (ANSI) requires no less than 3-minutes of flushing weekly. Because of the potential for bacterial colonization growth in the devise, flushing for 15 minutes weekly is recommended. Researchers/employees nearest an eyewash location will complete this simple maintenance routine per week and check off the task was completed on the *"Emergency Eye Wash Weekly Checklist,"* and should make all attempts to complete this routine on the same day of the week.

(2) **Cuts, punctures and needle sticks:**

(a) In the event of a parenteral or mucous-membrane exposure to blood or other potentially infectious bodily fluids, the employee will report incident to supervisor or to Infection Control 1-4765. Employee should report immediately to Employee Health Service (M-F 8am-4:30 pm) or to Triage (other hours and holidays) the same day as the incident. Employees will submit VA Labor Form CA-1 (Federal Employees Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation) to supervisor. The supervisor will input the incident in the ASISTS computer program.

(b) If the objects or bodily fluids which caused the injury are contaminated with patients, or research animal specimens, identify the specimen with the patients name or animal identification for further evaluation and investigation by supervisor. Clean affected area immediately with surgical soap. Consult Employee Health at once.

(c) The Employee Health Clinic is responsible for initiating an investigation of the potential exposure, to include a careful history, identification of the source of the needle contact or mucous membrane exposure, and initiate appropriate studies to determine the need for treatment. Counseling for AZT prophylaxis will be provided by Employee Health Service of Chief Medical Office of Triage at the time of initial evaluation.

(d) Needle stick packets can be obtained from Employee Health/Urgent Care.

(e) If the injuries are clean cuts, punctures, and needle sticks, clean the affected area immediately with surgical soap, then flood or soak affected area in antiseptic fluid. Bandage to prevent infection.

(f) If the injuries are dirty cuts, punctures, or needle sticks, i.e., those contaminated with blood or body fluids or bacterial agents, proceed as above as long as the object which caused the wound is not left in the wound.

(g) If the object causing the injury is not easily removed, do not attempt to cleanse the area. Doing so may cause further damage. Consult Employee Health immediately.

(h) Report all accidents of any degree and consult Employee Health. Needle sticks are tracked and exposures investigated by the STVHCS Safety Office.

(3) **Chemical Burns:**

(a) Corrosives can cause second or third degree burns. These chemicals include alkalis such as sodium hydroxide and common acids such as hydrochloric, sulfuric, and nitric.

(b) Chemicals should be diluted and washed off with copious amounts of water. Minor splashes and spills can be flooded in a sink. Larger splashes and spills require the use of the emergency drench-type laboratory shower. Enlist the help of coworkers. Some chemical powders should be brushed off the skin, before flooding with water, to avoid further skin and tissue damage. Always consult the chemical manufacturer's SDS for emergency first aid procedures BEFORE working with any chemical.

O. **CHEMICAL INVENTORIES:** Each lab must maintain a complete inventory of all chemicals utilized within the lab. Submit an electronic copy to the IACUC administrator and/or Administrative Officer for forwarding to Safety office. A copy of all lab chemical inventories will be maintained in a binder with the master copy of SDS. The Administrative Officer will maintain a copy on the share folder or a 3-ring binder. (See Attachment for sample Chemical Inventory format)

(1) **Inventory:** The responsible supervisor (Principal Investigator) or researcher will maintain a current inventory of chemicals stored/used for each lab room, annotated with the date of the inventory, the room, and the responsible individual their contact information (phone/email).

(2) Sort the inventory alphabetically. Update and provide the inventory to the Safety Office (Industrial Hygienist) whenever a new type of chemical is added to or taken off the inventory and review the National Fire Protection Association (NFPA) placard(s) on room doors to confirm they are still accurate. Keep the inventory in the front of the SDS binder. Also a signed acknowledgement that each employee/researcher read and understand this Chemical Hygiene Plan is completed annually.

P. **ACCIDENT REPORTING:**

(1) Always refer to the most current Accident/Incident Investigation and Reporting Policy Memo (001A-15-35) for procedures and delegated responsibilities. Employee should promptly report all accidents/illnesses/incidents to their lab supervisor. All incidents that involve VA or WOC employees shall be reported via the VISTA ASISTS computer accident reporting program. All accidents shall be documented properly and timely.
Immediately Following Notification of Injury (Supervisor/Principal Investigator's Responsibilities)
a. Stabilize employee.
b. Offer to take the employee to Occupational Health/Emergency Department.

c. Initiate VA Form 2162 (Report of Accident) in ASISTS.
d. Advise employee of Workers' Compensation (WC) Rights and Responsibilities (Workers' Compensation Program Policy 05-11-12)
e. Employee must file WC claim if unable to return to duty the next day.
f. Refer the employee to WC Specialist for more information.
g. Investigate incident including: obtain witness statements, review of work area, and work with Safety Office to determine if hazard continues.
h. Investigate and complete VA Form 2162 within 72 hours of incident.
i. Initiate corrective action.

(2) After the VA Form 2162 is completed the injured employee submits form CA-1 (Federal Employees Notice of Traumatic Injury and Claim for Continuation of Pay/Compensation) electronically if the accident results in an injury or CA-2 (Federal Employees Notice of Occupational Disease and Claim for Compensation) for occupational disease.

(3) Supervisors will conduct an investigation of the accident/incident. When applicable, this will be accomplished with the assistance of the hospital safety specialist.

(4) Medical records will be retained in accordance with the requirements of State and Federal regulations.

Q. **SIGNS AND LABELS:**

(1) **Signs should be posted:**

(a) Emergency telephone numbers of emergency personnel, supervisors, and laboratory workers.

(b) Location signs for safety showers, eyewash stations, and other safety and first aid equipment.

(c) Location of emergency exits.

(d) Location of spill kits.

(e) Location of SDS.

(f) Warnings at areas where unusual hazards exists such as radioactive materials, x-ray equipment, etc.

(g) Location of Personal Protection Kits

(h) NFPA Door Signs: Mark each entrance into a room where hazardous materials are stored with an appropriate NFPA placard (aka "NFPA diamond"). Replace or update fading, damaged, or no longer accurate placards (e.g., as hazardous materials are added and removed from the inventory ensure the placard still reflects the hazards in the room.

(2) **Chemical labeling required:**

(a) **Chemical identity:** Every container of hazardous material needs a clear and accurate label describing its contents in plain English (e.g., "EtOH" should not be used to describe the contents, instead use "Ethanol" or "Ethyl Alcohol"). For containers without manufacturer labels or where manufacturer labels have faded, use a hazardous material label and hand write with a permanent marker or type/print with a laser printer the appropriate information onto the label. Non-hazardous material containers must

be labeled "Non-hazardous Material" and describe its contents in plain English. Replace all faded, peeling, damaged, or otherwise deteriorated labels.

(b) Appropriate hazard, i.e., caustic, corrosive, poison irritant, flammable, carcinogen, etc.

(c) All chemical solutions of 1% or greater must bear same hazard warning label as concentrated chemical.

(d) Date received

(e) Expiration date, if any

(f) Date opened

(g) Storage requirements: Review chemical incompatibility (info typically found in SDS) for each item in storage and segregate incompatible chemicals in separate storage locations.

In addition to the above, chemicals stored in common use cold rooms must be labeled with investigator name, date, contact person, and phone number. Label refrigerator/freezers with "*Chemical Storage Only- - Do not store food in this refrigerator*" [or freezer, as appropriate]. Label all non-explosion proof refrigerator/freezers with "Do *Not Store Flammable Materials in This Refrigerator*" [or Freezer, as appropriate].

R. **SPILL AND ACCIDENTS:**

(1) **Chemical spills:**

(a) All spills must be reported to the Safety Office (Rm. 034 or ext. 14039). Spill control kits and protective equipment are provided in Room V203. Personnel should use appropriate protective equipment and clothing to minimize chemical exposure during spill clean-up. Employees should be trained on the proper use of spill kits.

(b) Mercury Spills - ventilate area; evacuate personnel and patients from the area; immediately notify EMS (ext. 14063 including after hours) for cleanup and Industrial Hygienist (ext. 14039) as to location and degree of spillage. Researchers should switch to digital thermometers and turn in their mercury thermometers to the GEMS Coordinator. NOTE: Mercury spills should be a rare occurance since most mercury devices, such as thermometers, have been replaced with digital equipment.

(c) Acid-base spills - Neutralize spill at once, using spill kits provided in room V203. Special protective equipment, i.e., goggles, gloves, masks, fluid impervious gowns should be used for clean up. For a large spill, ventilate the area and evacuate the area and notify the Industrial Hygienist.

(d) Large Mixed Spills - Ventilate area, evacuate area immediately and notify Industrial Hygienist . Never attempt to clean up any spill larger than can be accommodated by the spill kits.

SPILL CLEAN UP PROCEDURES ACCORDING TO OSHA (STOP! – call the Safety Office during regular duty hours at 1-4041 or 1-5170 and report your spill and ask for further instructions). Spill cleanup instructions are mounted on the wall in V203.

i. Isolate the area and seek assistance.
ii. If the spill is chemical, get the SDS Sheet and read how to clean up the spill.

iii. Retrieve the spill kit (room V203) containing the following items: *Absorbent, personal protective equipment (face shield, gown, gloves), small broom and dust pan, bags for disposal, paper towels for cleaning, & disinfectant.*
iv. Put on the appropriate personal protective equipment (PPE): face protection, gown and heavy-duty gloves (or double up the gloves you have available).
v. Pour absorbent on the spill, using enough that the spill becomes manageable in a solid form. A special spill kit or powered sulfur must be used to clean a mercury spill (Call the Safety Office at 14041 or 15170).
vi. Using the broom and scoop in the chemical spill kit, sweep up the spill and dispose of it according to SDS directions or if it is a BioHazard spill dispose of it in a RED bag.
vii. Clean the area with soap and water or call EMS at 15142.
viii. If the spill is potentially biohazardous spray the area with a hospital grade disinfectant using the spray-wipe-spray technique.

(2) **Biological Spills:**

(a) Large spills with significant aerosol formation - evacuate area immediately and notify Industrial Hygienist and/or Infection Control Program Manager (ext. 1-5108).

(b) Small spills with aerosol formation - place paper towels over spill, flood with amphyll or 5% sodium hypochlorite, leave for 10 minutes, pick up contaminated materials with gloves, and dispose in biohazard bags and place in large red biohazard cans or autoclave if required.

(3) **Spill Evaluation:** All spills and near spills will be carefully analyzed by Research Safety Subcommittee, and STVHCS Safety Committee. Following analysis, results will be given to all personnel to prevent further incidents.

S. **TRAINING:**

(1) **General:** The principal investigator/supervisor shall insure a copy of the chemical hygiene plan (CHP) will be readily available to all personnel working in the lab. Additional copies may be obtained from the Research Office. Supervisors shall ensure employees receive information on safe handling practices to avoid exposure above permissible limits. This should be documented in staff meeting minutes. Supervisors must convey the information to those not present during presentations.

(2) **Orientation/Annual Training:** Principal Investigators/supervisors must provide a safety orientation prior to the individual starting to work in the lab. Supervisors must also ensure all employees complete all mandatory safety training and the site-specific training on an annual basis.

T. **HARZARDOUS WASTE DISPOSAL:**

(1) **General:** VA Policy Memorandum 001A-11-22, "Waste Assessment and Disposal Policy," describes the hazardous waste disposal procedures for the VA in room L019. The policy fully describes procedures for waste collection, segregation, storage, and transportation including materials that can be drained, disposed, or incinerated. SDS should be consulted for manufacturers recommended disposal method. Determine if a waste chemical is exempt under 40 CFR 261.4 of the Resource Conservation and Recovery Act (RCRA) exclusions. The primary exclusions listed that apply to VA Medical Centers are domestic sewage and any mixture of sewage and other waste that passes through a sewage system to a publicly own treatment works (POTW) for treatment. (Refer to 40 CFR 261, Subpart D, Appendix A, Attachment F).

(a) No listed hazardous waste may be disposed of without prior approval of the Green Environmental Management System (GEMS) Coordinator at ext. 1-5170.

(b) Creating/Collecting Waste: Before creating or collecting any waste from hazardous material use, contact the GEMS coordinator and be prepared to provide:

1. A description of how the waste will be generated, all of the materials used to create the waste and their percentage (or range) in the waste, and SDS for each of the materials.

2. Collect all waste chemicals and solutions containing hazardous material in their original container or an appropriate waste container type approved by the GEMS Coordinator (usually a thick solid glass container is appropriate). Provide secondary containment for all hazardous waste containers – this means placing a plastic bin or tray with a lip to hold your liquid waste containers).

3. For containers of acute hazardous wastes, contact the GEMS Coordinator for pick-up to determine what "Triple Rinse" procedures are appropriate before proving to EMS. For acute hazardous waste DO NOT perform a triple rinse.

4. Expired chemicals: Contact the GEMS Coordinator at least 1 week before any chemical on your inventory is expected to expire to coordinate a date/time for the material to be picked up. Be prepared to provide an SDS for the material.

5. Empty containers: Any container that previously held a hazardous chemical or waste (with the exception of acute hazardous wastes) will be considered empty and can be provided to Environmental Management Services (EMS), if:

a. No hazardous materials can be poured, pumped or drained from the container.

b. No hazardous materials remain in the container that can be feasibly removed.

c. The walls of the container must not contain any significant residual materials.

d. The words "*empty*" are conspicuously placed on the container.

e. The container did not previously hold any material in 40 CFR 261.33 "P" or "U" listed wastes.

(2) **Liquid waste sewer disposal:** Do not dispose or wash any hazardous material into sink/floor drains unless approved, in writing, by the GEMS Coordinator. Some liquids may be flushed into the sewer system with copious amounts of water provided chemical volume is minimal. Disposal through the sewer system must comply with all Federal, State, and local regulations and ordinances. Consult GEMS Coordinator when in doubt as to whether a chemical can be disposed via the sewer system.

(3) **Contractor disposal:** (Formaldehyde, methanol and xylene) - The Safety Office should be provided a list of chemicals to be picked up (chemical, quantity, investigator & room). Lab personnel should ensure chemicals to be picked up are labeled, have an accompanying SDS, and are stored incompatible groups. The Safety Office will advise the lab when the contractor will be on site for pickup. The Safety Office will maintain records on chemicals disposed.

(4) **Biological waste:** Hazardous waste which includes animal waste, human blood and blood product, microbiological waste, pathological waste and other material which has become contaminated

with the above material in such a way as to become an agent for transmission of diseases will be picked up by the facility contractor.

(5) **Radioactive waste:** Radioactive waste can only be disposed of in the designated sink. Labs generating solid radioactive waste must transport that waste to this lab (S204) and will NOT dispose of radioactive waste in their assigned labs.

6. **REFERENCES:**

STVHCS Policy Memorandum 001A-14-16, "Hazard Communication Program"

STVHCS Policy Memorandum 11-15-84, "Procedural Response to Bloodborne Pathogen Exposure"

STVHCS Policy Memorandum 001A-11-22, "Waste Assessment and Disposal"

STVHCS Policy Memorandum 007-15-13, "Peroxide Forming Compounds"

STVHCS Policy Memorandum 007-15-43, "Formaldehyde Policy"

STVHCS Policy Memorandum 001-10-31, "Mercury Management Policy" (not updated as of 12/31/2015)

STVHCS Policy Memorandum 007-15-14, "Picric Acid Policy".

STVHCS Policy Memorandum 001A-14-18, "Personal Protective Equipment and Clothing Policy"

STVHCS Policy Memorandum 001A-15-19, "Respiratory Protection Program"

STVHCS Policy Memorandum 001A-14-20, "Chemical Spill Clean-up Policy"

STVHCS Policy Memorandum 001A-15-35, "Accident-Incident Investigation and Reporting Policy"

STVHCS Policy Memorandum 001-10-27, "Exposure Control Plan" (not updated as of 12/31/2015)

STVHCS Policy Memorandum 001A-15-39, "DOT Hazardous Materials Security Plan"

STVHCS Policy Memorandum 001-11-34, "Fire Safety Management Plan"

STVHCS Policy Memorandum 001-10-22, "Safety Training Requirements" (not updated as of 12/31/2015)

STVHCS Policy Memorandum 001R-13-07, "Radiation Exposure Reporting Policy"

STVHCS Policy Memorandum 116A-15-11, "Inventory and Control of Hazardous Items"

STVHCS "Radiation Safety Handbook" 2008.

Keyword search: Prudent Practices in the Laboratory, Handling and Management of Chemical Hazards (2011); ISBN: 978-0-309-13864-2; National Research Council of the National Academies (www.nap.edu) free download

Keyword search: Biosafety in the Laboratory, Prudent Practices for Handling and Disposal of Infectious Materials (1989); ISBN: 978-0-309-09024-7; National Research Council of the National Academies (www.nap.edu) free download

7. **RESCISSION:** 12-04, November 19, 2012.

JACQUELINE A. PUGH, M.D.
ACOS Research and Development

ATTACHMENTS

APPENDIX A

DISTRIBUTION: Research Service Employees & Researchers

APPENDIX A

The Hazard Communications Regulations (Lists are not all inclusive, just examples.)

Put these on your chemical inventory list and get SDSs for each:
Acetone (might be nail polish)
Albuterol
All Antineoplastic Drugs
Aluminum Chloride
Ammonia Ampules
Atropine Sulfate
Benadryl
Benzocaine
Betadine
Bleach
Botox
Butane Gas
Celestone
CitriCide, CitriFoam, CitriGuard
Cyanocobalamin
Cytology Fixative
DepoMedrol
Enzymatic Detergent
Estradiol
Ethyl Oxide
Formalin/Formaldehyde
Gentian Violet
Glutaraldehyde-Gdex, Metricide, Omnidde, etc.
Hydrogen Peroxide 30%
Insulin
Isopropyl Alcohol
Kenalog
Lidocaine, Zylocaine, Marcaine, etc.
Lysol Professional Products
Mercury in Blood Pressure Cuffs or Thermometers
(if present)
Methanol, Denatured Alcohol
Monsel's/Ferric Subsulfate
Nitrous Oxide Gas, Compressed Oxygen Gas
Phenol
Professional Disinfecting Wipes-caviwipes, sani-
Wipes, Sani-Cloths
Professional Janitorial Products
Propane
Silver Nitrate Applicators
Testosterone
Tincture of Benzoin
Trichloracetic/Bichloracetic Acid
Ultrasound Transmission Gel
X-ray Fixer and Developer

"HAZCOM EXEMPT" Means no SDS is required

Air Fresheners
Aspirin, Tylenol, Ibuprofen
Carpet Cleaner
Copier Toner
Cosmetics
Detergent and Fabric Softener
Dishwashing liquid or Powder
Floor Cleaner from the Discount Store
Food and Beverages, including Glucola
Furniture Polish-e.g., Pledge
Hand Soap, Hand sanitizer, and Lotion
Hydrogen Peroxide 3%
Liquid Correction Products (White Out; use is forbidden by Medicare)
Most Eye Drops and Ointments
Mr. Clean, Formula 409
Neomycin/Triple Antibiotic Ointment
Personal Use Items brought by Employees
Petroleum Jelly; K-Y Jelly
PPD for TB Skin Testing
Saline
Sealed sample Medications
Sterile Water, Deionized Water
Surface Wipes from the Discount Store
Tablets and capsules
Toilet Bowl Cleaner
Toothpaste and Mouth Wash
Vaccines: HBV, Flu, etc.
WD-4O
Window cleaner (such as Windex)