

COLLEGE OF HEALTH AND BEHAVIORAL STUDIES (CHBS) LABORATORY/FACILITY SAFETY PLAN

College of Health and Behavioral Studies

**James Madison University
Harrisonburg, Virginia 22807**

Based on the CISAT Plan developed by George L. Coffman

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I. Purpose, Scope and Authorship

The purpose of this document is to establish procedures used, personal protective equipment required (or recommended), and work practices to be followed that will protect employees, students, and visitors to CHBS facilities from health risks presented by potentially hazardous chemicals and biological agents, as well as injury from equipment if used without appropriate regard to safety.

As recommended by *Prudent Practices for Handling Hazardous Chemicals in Laboratories: Handling and Disposal of Chemicals*, the *CHBS Facility Safety Plan* contains these elements:

- employee information and training about the hazards of chemicals in the work area, including how to detect their presence or release, work practices and how to use protective equipment, and emergency response procedures;
- the circumstances under which a particular laboratory operation requires prior approval from the employer (administrator, director, manager);
- standard operating procedures for work with hazardous chemicals;
- criteria for use of control measures, such as engineering controls or personal protection equipment;
- measures to ensure proper operation of fume hoods and other protective equipment;
- provisions for additional employee protection for work with “select carcinogens” (as defined below) and for reproductive toxins or substances that have a high degree of acute toxicity;
- provisions for medical consultations and examinations for employees; and,
- designation of a chemical hygiene officer.

In addition, this document contains safety information regarding laboratory equipment commonly found in chemical, biochemical, anatomy, physiology, and microbiological laboratories.

This plan applies to all JMU CHBS employees and students, as well as onsite outside contractors and visitors—all persons whose work or activities within a CHBS laboratory/ facility may expose them to physical, chemical/biochemical, and biological hazards. All laboratory workers—faculty, staff and students of CHBS, as well as visitors to any CHBS facility—should be given ready access to this plan.

Authorship

This document was composed as an adaptation of a plan originally written for the particular needs of the Integrated Science and Technology program. This safety plan was first authored by George L. Coffman, the former CISAT Chemical Hygiene and Safety Officer. In the fall of 2008, changes in the document were made so that it applied to any science and/or manufacturing/engineering laboratory of the College of Integrated Science and Technology (CISAT) and the newly established School of Engineering (SOE). James L. Ridings, P.E., significantly contributed to that version.

On July 1 of 2012, two new colleges were formed: the College of Integrated Science and Engineering (CISE), and the College of Health and Behavioral Studies (CHBS). This document was revised by the CHBS Laboratory Safety Committee during the 2013-14 academic year.

II. CHBS Laboratories Covered by this Policy

The regulations and policies outlined in this document apply to these CHBS facilities:

Communication Sciences and Disorders

Clinical

HHS 1019 Applied Audiology Laboratory

Human Audition Research

HHS 1015 Sensory-Neural Engineering Research Laboratory

HHS 1009(a) Human Auditory Perception and Physiology Lab

HHS 1009(b) Neural Bases of Communication and Swallowing

HHS 1018 Psychoacoustic Research Laboratory

HHS 1024 Hearing Aid Research Laboratory

Animal Research

HHS 1016 Auditory Research Laboratory

HHS 0109 Computational, Speech, Sensory, Development & Diseases Laboratory

Health Sciences Department

Nutrition

HHS 0008 Quantity Foods Laboratory

HHS 0009 Nutrition Laboratory

HHS 0119 & 0120 Sensory Evaluation Laboratories

Physician's Assistant Program (Health Sciences Department)

HHS 2018 Health Assessment Laboratory

Burruss 253 & 256 Med/Surg Simulation Laboratories

Occupational Therapy Program

HHS 3028 Functional Development Laboratory

HHS 3102 Home Assessment Suite

Health Assessment

Burruss 052 & 057 Human Assessment

Kinesiology

Godwin 120 Exercise Science Auxiliary Laboratory

Godwin 209 Human Performance Laboratory

Godwin 217 Exercise Science Laboratory

Nursing

Burruss 021 Home Environment Lab

Burruss 135 Assessment Lab

Burruss 137 Laboratory Preparation Area

Burruss 138 Seminar Lab

Burruss 144 Skills Lab

Burruss 251 Women's and Children's Sim Lab

Burruss 253 Critical Care Sim Lab

Burruss 256 Med/Surg Sim Lab

Psychology

Miller G060 – G074 Animal/Neuroscience Facility/Laboratories

Miller G077 Health Psychology Laboratory (Treadmill)

III. Required Practices & Training

Posting of Laboratory Safety Policies

For each laboratory, a single page, easy-to-read 'Lab/Facility-Specific Safety Policy' sheet must be posted on a wall or a door. Issues pertinent to that lab or facility, such as:

- the requirements for PPE (e.g., eye protection, gloves, footwear),
- the prohibition of food and drink,
- any unique physical, chemical, or biological hazards that require special attention and/or a more rigorous demand for chemical hygiene or safe work with biological agents,
- any modifications of, or enhancements to, those policies stated in this safety document for that particular laboratory for a designated chemical, biological agent, or piece of equipment or instrument that poses a potential hazard, and
- contact information (emergency and names of responsible personnel, their telephone numbers and e-mail addresses)

Emergency Response

Contact Campus Police by telephone (540 568-6911) for all emergencies including, but not limited to: Alcohol poisoning, assault, bomb threats, chemical spill, criminal activity, fire, suspicious persons, shelter in place, medical emergency, severe weather, mental health, utility failure and weapons. Campus Police will call off-campus agencies or services, as appropriate to the nature of the emergency.

While awaiting medical attention, initiate general 'first-aid' steps in case of exposure to potentially hazardous chemical agents, such as combustibles and flammables, corrosives/irritants, or reproductive toxins, high acute toxicity chemicals and carcinogens:

- Remove any clothing saturated with spilled chemicals
- Wash affected skin areas with soap and water and flush for at least 15 minutes
- Flush eyes with water at an eyewash station for at least 15 minutes
- For severe exposures due to inhalation, remove victim to fresh air, keep warm and still
- For ingestion, keep victim warm
- In all cases, check the Safety Data Sheet (SDS) for the chemical (if known) for more specific first-aid information

If an emergency situation arises that is believed to be associated with a person's working with a potentially hazardous biological agent, information about that agent and the nature of the work performed in that laboratory should be communicated to the emergency responder.

In case of incidents that do not constitute a medical emergency or great danger to personnel (such as breakage of glassware or malfunctioning of equipment), there may be no need to contact campus police. Instead, report the problem to the laboratory supervisor for advice regarding how to respond. Care must be taken to minimize potential hazards as soon as possible if a potential hazard exists. This may include actions such as unplugging equipment, hanging appropriate warning signs, and cleaning up the area.

Health/Medical Issues

For information pertaining to **acute** exposures to chemical agents, consult the SDS for that chemical.

Information about **chronic** exposure can be found on the OSHA, CDC and NIOSH websites noted under the 'Sources of Information,' below.

Information pertaining to biological agents used in a CHBS laboratory that pose a possible safety threat may be found on OSHA and CDC websites noted under the ‘Sources of Information,’ below.

Medical consultation, evaluation, and any treatment deemed appropriate will be available through the campus health center or from Rockingham Memorial Hospital.

Training

Each laboratory instructor/supervisor or research adviser is responsible for ensuring that all individuals who work in laboratories receive adequate training. This training should include:

- 1) Any physical and health hazards of chemicals, biological agents, and equipment located in the work area
- 2) The measures employees and students can take to protect themselves from such hazards, including specific procedures that have been implemented to protect laboratory employees from exposure to hazardous chemicals, biological agents, and potentially dangerous equipment (e.g., appropriate work practices, personal protective equipment to be used, and emergency response procedures)
- 3) Safety procedures such as those described in this safety document and in supplemental materials appropriate for the specific laboratory.

Information and training that shall be provided by the laboratory director/work or project supervisor will be given

1. at the time of an employee’s or student’s initial assignment to a work area where hazardous chemicals, biological agents, or equipment or instrumentation are present, and
2. prior to assignments involving new exposure situations.

The frequency of refresher information and training may be determined by the laboratory supervisor/instructor. Safety information concerning chemical, biological or physical issues appropriate to a particular teaching or research laboratory/facility will be provided during safety training sessions held at the beginning of each semester to all persons (students, employees) directed to oversee any section of CHBS laboratory courses as well as all students or employees involved in laboratory/facility preparations or projects.

Personnel working with animals require special additional training. Training expectations for personnel working in animal laboratories are described within the Standard Operating Procedures documentation for Vivaria (See <http://www.jmu.edu/researchintegrity/iacuc/iacuctraining.shtml>).

Sources of Information

Each laboratory instructor/supervisor or research adviser is responsible for ensuring that this information is communicated to his/her employees and students under his/her direction:

- (1) **The location and availability of this safety document**
- (2) **Sources of safety information about**

- chemicals used in his/her laboratory or facility, including OSHA ‘Permissible Exposure Limits’ (OSHA PELs and other information for select chemicals), NIOSH (National Institute for Occupational Safety and Health) ‘Recommended Exposure Limits’ (NIOSH RELs), NIOSH ‘Immediate Dangerous to Life and Health’ values (NIOSH IDLHs)

<http://www.osha.gov/SLTC/pel/recognition.html>

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9992

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9993

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9994

<http://www.cdc.gov/niosh/npg/>

<http://www.cdc.gov/niosh/idlh/intridl4.html>

- potentially hazardous apparatus/equipment, e.g., safety information provided by the manufacturer or contained in government documents

<http://www.osha.gov>

- (3) Safety Data Sheets (SDSs), vendor-specific, for all chemicals in his/her laboratory/facility
- (4) Information pertaining to biological agents (both their laboratory use and their disposal) that are deemed hazardous or potentially hazardous, e.g., safety documents provided by the instructor/supervisor or research supervisor, CHBS Safety Officer, or offered in government documents

<http://www.cdc.gov>

- (5) Operating instructions for equipment supplied by the manufacturer.
- (6) Protocols for administration of exercise testing and prescription: ACSM's Guidelines for Exercise Testing and Prescription (9th Edition), ISBN: 9781609139551.

IV. Laboratory Safety Procedures

Written Laboratory Safety Rules must be provided to each individual who works in a CHBS laboratory listed in section II, prior to the start of work in that facility. Students in CHBS courses involving laboratory/facility work may receive a version, appropriate for their particular course. Individuals acknowledge their receipt, review and understanding of safety rules by completing an online form described later in this manual.

General Guidelines

1. **Responsible behavior in the laboratory is essential.** The dangers of spilled acids and other chemicals, as well as broken glassware created by thoughtless actions, are too great for irresponsible behavior to be tolerated.
2. **Students must be adequately prepared for laboratory work.** Students should be knowledgeable about laboratory procedures and the proper use of equipment prior to working independently in laboratories. Students should practice appropriate and safe techniques while learning and practicing skills in the lab.
3. **Laboratory doorways must be accessible at all times.** Furniture should not be placed to obstruct the entries/exits.
4. **Laboratory access is limited to authorized individuals only.** Unauthorized individuals are not allowed in labs at any time.
5. **Do not eat, drink, chew gum, smoke, or apply cosmetics in the lab.**
6. **Wash hands** frequently, and especially after handling chemicals, bodily fluids (sweat, blood, urine, etc.), as well as before and after touching people and animals.
7. **Keep your work area neat and organized** for efficient work and to avoid accidents.
8. **Electrical Safety**
 - Wet materials may not be used around electrical outlets or equipment.
 - Students are responsible for reporting to the appropriate laboratory supervisor any frayed electrical cords, cracked plugs, missing outlet covers, etc., as well as any problems encountered while using electrical equipment.
 - No electrical cords will be left in the pathway of walking traffic.
 - Non grounded (2-prong) extension cords shall not be used.
 - Extension cords are for temporary use only.
9. **Ergonomics**
 - Use caution when lifting heavy objects, equipment, and/or people. Seek assistance when needed.
 - In labs requiring heavy lifting, students will be instructed in principles of body mechanics and safe lifting prior to practicing these skills. Equipment wheels (e.g. beds, wheelchairs, stretchers) are to be locked during practice and return demonstrations.
 - Equipment needed for heavy lifting (e.g. beds, wheelchairs, stretchers, carts, dollies, etc.) must be kept in good working condition. Report any faulty or broken equipment immediately to the laboratory supervisor.

10. **Review Safety Data Sheets (SDS) before using hazardous chemicals.** All laboratory workers should be familiar with information concerning all potentially hazardous chemicals before using them. SDS include information about safe handling, disposal and steps to take in case of accidental release (e.g., spill, leak). Knowledge of this type of information should be in hand BEFORE the chemical is handled.
11. **No unauthorized experiments in the laboratory.** Use only the quantities of reagents as instructed in written procedures, and no more. Consult your instructor if you have any doubts about the instructions in the laboratory manual or written procedure. Prior approval should be obtained from the supervisor/instructor whenever a new laboratory procedure, test or experiment is carried out, or there is a change in an existing procedure, test or experiment.
12. **Work in the laboratory should be carefully ‘thought out’.** Plan ahead. If you give no thought to what you are doing, you predispose yourself to an accident.
13. **Students should report allergies, injuries and/or mobility limitations, communicable disease or other health concerns** (such as those that occur during pregnancy, after surgery, or during medical treatment) to their laboratory supervisor as soon as possible so that necessary precautions may be taken. At the discretion of the laboratory supervisor, medical clearance from a physician may be required before students may be permitted to work in laboratories that might present hazards to the student.
14. **Cleaning and Maintenance of the Laboratory and Equipment**
 1. It is the responsibility of all those who use a laboratory for keeping equipment and the physical space clean, neat and orderly. Supplies should be replaced at the end of each session; shortages should be reported to the Laboratory Supervisor.
 2. Floors, counters, and furniture will be cleaned by appropriate personnel at the end of each semester and more frequently if needed.
 3. Laboratory equipment will be cleaned and serviced as needed. The protocol for cleaning equipment is directed by the product manufacturer.
 4. Laboratory safety equipment must be regularly checked and maintained.
 - Eye wash stations must be activated and inspected monthly.
 - Fume hoods face velocity will be evaluated annually by the JMU Environmental Health Coordinator.
 - Fire extinguishers will be inspected monthly by JMU Facilities Management.

For laboratories in which specific safety precautions are necessary (as specified on the posted safety procedures sign), the following procedures are required:

Personal Protective Equipment

1. **Wear approved eye protection**—that which meets the requirements of ANSI Z87.1—at all times in all CHBS laboratories when there is a possibility of injury to the eyes because of ongoing chemical/biological laboratory/facility procedures (e.g., from chemical exposure, boiling water, projectiles).
 - Eye protection should protect against chemical splashes or physical impact. Goggles, or other special eye protection, must be worn by those who already wear prescription glasses.
 - If your eyes come into contact with an acid, alkali, abrasive or otherwise irritating substance, wash your eyes with flowing water from an eyewash station for at least 15 minutes. Seek medical attention immediately.
2. **Footwear that completely covers the feet is required when hazardous chemicals are present** because of the possibility of chemical spills, broken glassware on floors in chemical/biological laboratories.

3. **Confine long hair and loose clothing** (such as flowing sleeves, scarves, etc.)
4. **A lab apron or coat must be worn when:**
 - you are wearing easily combustible clothing, such as synthetic and light fabrics,
 - working with and/or transporting hazardous chemicals.
5. **Gloves should be worn when working with hazardous chemicals.** These gloves should be made of a material known to be resistant to permeation by that chemical. Inspect gloves before each use to assure structural integrity. If gloves are not disposable (e.g., thin latex or nitrile), wash them before removal and replace them as needed.
6. **Personal Protective Equipment (PPE) is often required when working with animals.** The use of PPE in animal laboratories is described within the Standard Operating Procedures documentation for Vivaria (See <http://www.jmu.edu/researchintegrity/iacuc/sops/index.shtml>).
7. **Latex Allergies.** Students, faculty and staff may come in contact with products containing latex in the laboratory environment including, but not limited to, disposable gloves. Individuals who are allergic to products containing latex, must notify the Lab Supervisor who will make appropriate accommodations to minimize the risk of allergic reaction.

Clinical Laboratories (Including Nursing and Exercise Science)

1. **Complete JMU's Bloodborne pathogen training** (<http://www.jmu.edu/bbp/>) prior to working in clinical laboratories, or conducting other laboratory activities requiring the handling of blood or other bodily fluids .
2. **Standard Precautions:** Standard precautions are based on the fact that the existence of pathogens cannot be known in all situations. In some instances, patients harboring blood-borne infections may never be identified as representing a potential infectious risk. In settings such as outpatient clinics, identification of patients who present a potential infectious risk is impractical if not impossible. Because one can never be sure who might be infectious, STANDARD PRECAUTIONS are recommended for all patient contacts. These precautions should minimize the risk of transmission of blood-borne infections. Therefore, all blood or other potentially infectious materials are to be handled as if they are contaminated by a blood-borne pathogen. Under circumstances in which differentiation between body fluid types is difficult or impossible, all body fluids shall be considered potentially infectious materials. Laboratory specimens from all patients must be treated as infectious.
3. **Hand-washing and Other General Hygiene Measures:** Hand-washing is a primary infection control measure and must be diligently practiced. Students shall wash hands thoroughly using soap and water or other approved antibacterial waterless hand sanitizer whenever hands become contaminated and as soon as possible after removing gloves or other personal protective equipment. When other skin areas or mucous membranes come in contact with blood or other potentially infectious materials, the skin shall be washed with soap and water, and the mucous membranes flushed with water, as soon as possible. Appropriate hand-washing facilities are available in clinical facilities and in the nursing skills center. Blood and body fluid spills should be cleaned up promptly. Gloves should be worn and the area decontaminated according to institutional policy. If not specified, a freshly made solution of one part chlorine bleach to 9 parts water can be used.
4. **Sharps Management:** Needles, especially contaminated needles and other contaminated sharps, should not be bent, recapped or removed. Shearing or breaking of contaminated needles is prohibited. Contaminated

disposable sharps shall be discarded, as soon as possible after use, in the disposable sharps containers. In practicum settings procedures are followed as outlined for sharps use and disposal. In the campus-based nursing skills lab appropriate containers (closable, puncture resistant, labeled or color-coded, and leak-proof on sides and bottom, and maintained upright throughout use) for the disposal of sharps are provided as a protective mechanism even though sharps are used for practice on oranges, manikins, etc. and do not involve use with human subjects. Nearly full containers are to be promptly disposed of and replaced. In the skills center the disposal of sharps containers is the responsibility of the Lab Coordinator.

- Students should handle needles and other sharps with extreme care.
- Used needles are to be disposed of in the sharps containers provided in the lab. Never recap needles. Do not dispose of needles and other sharps in the trash.
- Undergraduate students should use needles for laboratory injection practice only when faculty, staff or graduate assistants are present.

5. **Personal Protective Equipment:** Personal protective equipment is available and is to be used according to the specifications of the individual clinical site being utilized. Students are expected to wear personal protective equipment when doing procedures in which exposure of the skin, eyes, mouth, or other mucous membranes to blood or other body fluids is likely. The articles to be worn will depend on the expected exposure.

- **Protection for Hands:** Gloves should be worn when handling body secretions; when contact with blood or other potentially infectious bodily fluids and mucous membranes or non-intact skin is likely; when handling soiled items or surfaces; and when performing venipuncture or giving parenteral medications. Gloves should be changed after direct contact with each patient. Environmental contamination should be prevented by removing gloves as soon as possible after contamination. Gloves should not be washed and reused. Hands should be washed after gloves are removed. Gloves should be replaced as soon as feasible when contaminated, torn, punctured, or when their ability to function as a barrier is compromised.
- **Protection for Eyes/Nose/Mouth:** Masks and protective eyewear are not routinely indicated. In many instances, personal eyeglasses will provide adequate eye protection. Students shall wear masks in combination with eye protection devices (goggles or glasses with solid side shields) or chin-length face shields whenever splashes, spray, splatter, or droplets of blood or other potentially infectious materials may be generated and eye, nose, or mouth contamination can be reasonably anticipated. When suctioning intubated patients or caring for patients with productive coughs, e.g., during a sputum induction procedure, protection with masks and eyewear shall be used.
- **Protection for the Body:** Gowns are not routinely necessary, but a variety of garments including gowns, aprons, lab coats, clinic jackets, etc. are to be worn when soiling of clothes with blood or other body fluids is likely. Surgical caps or hoods and/or shoe covers or boots shall be worn in instances when gross contamination can reasonably be anticipated. If penetrated by blood or other potentially infectious material, the garments should be removed as soon as possible and placed in a designated container for laundering or disposal.
- **Laundry:** Linen soiled with blood or other body fluids are to be placed in bags designed and marked for that purpose as specified in the given institution. Contaminated laundry shall be handled as little as possible with a minimum of agitation. Wet contaminated laundry which may soak-through or cause leakage from bag or containers must be placed in bags or containers which prevent soak-through and/or leakage of fluids to the exterior.

6. Medications and Fluids

- Bottles, containers or fluids mixed in the lab must be labeled with the actual contents, date, and the initials of the preparer.

- When breaking glass ampules protect your fingers by using a gauze covering or an alcohol wipe and break the ampule in the opposite direction of your body. All used ampules must be disposed of in sharps containers only.

7. Sharps, Hazardous, and Biohazard Waste Disposal

- Potential biohazard waste is collected, contained, stored, and disposed of according to the Occupational Safety and Health Administration (OSHA) guidelines.
- Discharged batteries should be recycled.
- Sharps disposal is handled by JMU Facilities Management. When sharps containers are full the Lab Supervisor should be notified.
- Full containers of hazardous chemical waste must have the contents clearly labeled and the Laboratory Supervisor immediately contacts the University Environmental Health Coordinator to ensure that the waste is appropriately designated as Hazardous Waste and added to the Hazardous Waste Inventory.

8. Procedures for Evaluation and Follow-Up of Exposure Incidents

An exposure incident refers to specific contact of eye, mouth, or other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious material. A significant occupational exposure is defined as:

- A needle stick or cut caused by a needle or other sharp that was actually or potentially contaminated with blood or other body fluid.
- A mucous membrane (i.e., splash to the eye or mouth) exposure to blood or other body fluid.
- A cutaneous exposure involving large amounts of blood or prolonged contact with blood, especially when the exposed skin was chapped, abraded, or afflicted with dermatitis.

- 1) Immediate antiseptic procedures should be followed after possible or accidental exposure and the CDC guidelines for occupational exposure should be followed.
- 2) A student has an ethical duty to report any incident that exposed him/herself or a patient to the risk of transmission of a blood borne disease and is ethically obligated to be tested for HIV when the patient is exposed to a provider's blood.
- 3) Incidents of student exposure are to be reported immediately to the faculty member responsible for the specific experience. The faculty member in turn reports the incident to both the facility where the incident occurred, and their Program Director. Documentation of the exposure incident is to be submitted within 24 hours and should include: Route(s) of exposure; circumstances under which the exposure occurred; identification and documentation of the source individual if feasible; and follow up steps taken. When an exposure is reported that individual will follow the facility exposure plan for testing and evaluation.
- 4) Students having an exposure incident in a clinical agency without an established protocol should return to the university and follow university procedures.

Animal Laboratories

Individuals working in animal laboratories should refer to the JMU Standard Operating Procedures for Vivaria (<http://www.jmu.edu/researchintegrity/iacuc/sops/index.shtml>)

Exercise Laboratories

1. Laboratories in which individuals perform physical exercise must have procedures to assure that individuals are informed about the general risks and are questioned regarding medical conditions for which exercise creates a greater risk. (Follow the guidelines published in the current edition of ACSM's Guidelines for Exercise Testing and Prescription)

2. All operators of exercise equipment must be properly trained regarding the safe operation of that equipment.

Clinical Audiology Laboratories

1. Individuals who are tested in auditory labs must be informed of the risks of participating in those procedures and questioned regarding medical conditions which create a greater risk.
2. Laboratories in which individuals must conduct invasive procedures, such as insertion of devices into the auditory canal, must be properly trained in safe practices.

Chemistry/Biochemical/Biological Laboratories

1. As part of the **safety orientation** to the laboratory, all personnel must be shown the location of nearby fire extinguishers, fire blankets, safety showers and alarm pull stations. In addition, personnel must be informed of the location of the collection of Safety Data Sheets (SDSs) in the laboratory, and shown how to find information about particular chemicals of interest. If microbiological agents are to be used in the laboratory, information pertaining to 'Standard Microbiological Practices', will be provided.

All laboratory workers and students should know:

- how to learn about the hazards of a chemical as stated in the SDS and other appropriate references pertaining to that chemical
 - the location and proper use of emergency equipment
 - how and where to store chemicals properly when not in use
 - how to respond to a fire or accident
 - how to respond if a chemical is accidentally ingested
3. **In case of a chemical spill on your body or clothing**, wash the affected area with large quantities of running water. Remove clothing that has been wet by chemicals to prevent further reaction with the skin.
 4. **Promptly clean** all chemical spills and **properly dispose** of the spilled chemical and cleanup material.
 6. **Properly label and store all chemicals and equipment.** All chemicals (including solutions and chemicals transferred from their original containers) should be labeled with their names, concentrations and potential hazards, if known.
 7. **Do not eat or drink, smoke, or apply cosmetics in the laboratory facility.** Since many chemicals are absorbed through the skin, avoid direct skin contact. If you suspect skin contact with chemicals wash off these substances with large quantities of water. Wash your hands thoroughly with soap and water before leaving the laboratory. Do not store or handle food or beverages in laboratory areas. Never use refrigerators used for chemical storage to store food for human consumption.
 8. **Immediately report all injuries to your instructor or laboratory supervisor.** Except for very superficial injuries, you will be required to get medical treatment for cuts, burns, or fume inhalation. (Reports of accidents must be reported using a 'Laboratory Incident Report Form' that is submitted to the CHBS Safety Officer.)
 9. **Avoid directly breathing fumes of any kind.** Work in a chemical fume hood if there is the possibility that noxious or poisonous vapors may be produced.

10. **Do not use mouth suction to fill pipettes** with water, chemical reagents (aqueous or organic), or biologicals. Always use a suction device available in the laboratory.
11. **Confine long hair and loose clothing** in the lab, since either can catch fire or be chemically or biologically contaminated.
12. **Be careful when heating liquids**; add boiling chips or beads to avoid “bumping.” Flammable liquids such as ethers, hydrocarbons, alcohols, acetone, and carbon disulfide must not be heated over an open flame or on a hotplate.
13. **Always carefully and slowly pour acids into water** when mixing to avoid spattering.
14. **Do not force a rubber stopper onto glass tubing or thermometers.** Lubricate the tubing and the stopper with glycerol or water. Use paper or cloth toweling to protect your hands. Grasp the glass close to the stopper.
16. **Dispose of excess reagents** as instructed, typically by collecting them in appropriately labeled waste containers. The instructor or lab supervisor may selectively permit flushing small quantities of chemicals down the sink when this does not create a hazard.
17. **Laboratory doors leading to hallways are to be closed during any laboratory activity.**
18. **Do not block access to emergency equipment or exits.**
19. **Keep your work area neat at all times. All working surfaces and floors should be cleaned regularly.** Clean up spills and broken glass immediately. Clutter not only will slow your work, but it leads to accidents.
20. **Glassware:**
 - Do not use broken, chipped, starred or cracked glassware.
 - Clean all glassware after use.
 - Do not pick up broken glassware with bare hands. Use gloves or sweep up the glass fragments. Deposit broken glass in a “Broken Glass Safety Toss Box.”
 - Handle hot glassware with proper size and type of tongs or hot mitts.
21. **Vacuum and pressurizing equipment and materials:**
 - Use a safety shield whenever an implosion might occur when working with vacuum equipment. Shield or wrap Dewar flasks or other evacuated glass apparatus.
 - Use steam or heating mantles to heat vacuum distillation flasks.
 - Relieve vacuum in all parts of system before opening apparatus. Relieve vacuum slowly. Avoid sudden pressure changes that could cause breakage or spattering of contents. Do not relieve vacuum on heated apparatus until apparatus has cooled.
 - Use a safety shield whenever an explosion might occur when working with pressurizing equipment.
 - Do not apply pressure to standard glassware.
 - Vent pressure in all parts of the system before opening.
22. **Compressed gases:**
 - Store and transport compressed gas cylinders with the safety caps on.
 - Transport large cylinders on a hand truck to which the cylinder is secured.

- Cylinders should be clamped securely to a wall or other firm support with an appropriate cylinder clamp or chains as appropriate.
- Always use a reducing valve with gas cylinders.
- Do not lubricate, modify or tamper with a cylinder valve.
- Do not heat cylinders or store them near a heat source.

23. **At the end of the laboratory session, put away all chemicals, biochemical, biologicals and equipment and wipe your work surface.** All chemicals/biochemicals and biologicals, and their wastes, should be placed in their proper storage area at the end of the day.

Reporting Incidents & Injuries

1. Any incident or injury occurring in the laboratories must be reported immediately to a faculty member or the Laboratory Supervisor.
2. In the event of a physical injury or hazardous exposure, a Laboratory Incident Report form (available in the Appendix of this manual and at <http://www.jmu.edu/riskmgmt/>) must be completed and submitted to the Lab Supervisor. Copies of the form must be sent to JMU Risk Management and your Department Head.
3. Protocol for a physical injury/hazardous exposure:
 - Immediately report the incident to the Lab Supervisor (primary contact) and/or faculty member.
 - Medical consultation, evaluation and any treatment deemed appropriate will be available through the Campus Health Center or from Rockingham Memorial Hospital.
 - The Laboratory Supervisor will follow up with the student within three business days. A copy of the incident report and a written follow up report will be kept in a file within the Departmental Office.

Individual CHBS Laboratories and/or Departments often have additional safety documents. Laboratory supervisors are expected to provide these supplemental documents to every individual who works in their lab, make these readily available for inspection upon request, and evaluate student's understanding and compliance with safe practices as part of their laboratory experiences.

V. Activities and Projects Requiring Approval

Any projects that would involve chemicals/biochemical or pathogens deemed particularly hazardous (such as butyl lithium, or hydrofluoric acid), caustic agents, carcinogenic or mutagenic substances must be approved by the CHBS Facility Safety/Chemical Hygiene Officer (who will consult and inform the University Environmental Health Coordinator) prior to receipt of these chemical agents in any CHBS facility.

VI. Responsibilities

Dean of the College of Health and Behavioral Studies (CHBS)

- ◇ Oversees and administers all aspects of the College of Health and Behavioral Studies

CHBS Associate Dean

- ◇ Works with students, faculty, staff and university administrators to implement safety practices that are consistent with the CHBS Laboratory Safety Manual. This includes answering questions, may include periodic laboratory inspections.
- ◇ Receives reports from Lab Supervisors, Department Heads or concerned individuals regarding identified or possible laboratory safety problems. Helps facilitate the resolution of safety concerns.
- ◇ Receives reports of laboratory incidents if they occur. Significant incidents are discussed with the Dean.
- ◇ Chairs the College Laboratory Safety Committee.
- ◇ Continually improves and updates the college safety plan.
- ◇ Serves as the primary point of contact for the University Environmental Health Coordinator.
- ◇ Periodically provides a status report to the CHBS Dean regarding safety issues.

CHBS Laboratory Safety Committee

- ◇ Proposes safety policy for the college.
- ◇ By representing each academic unit with laboratories, brings safety concerns from departments to the college and brings safety ideas and policies from the college to departments.

Department Head

- ◇ Supervises faculty and staff responsible for laboratories.
- ◇ Works with CHBS Laboratory Safety Representative, CHBS Associate Dean and Dean to implement safe practices in departmental laboratories and follow up after incidents if necessary.

Lab Supervisors (Includes Supervising Faculty, Laboratory Instructors or Supervisors, and Principal Investigators)

- ◇ Responsible for safety in the particular laboratory/facility within his/her jurisdiction including laboratory labeling, signage, and recordkeeping. Is responsible for safety during:
 - meetings of formal laboratory classes
 - instructional sessions for lab supervisors and instructors
 - lab exercise set-up periods
 - faculty-student research sessions
- ◇ Ensures that laboratory workers know and follow the appropriate safety rules; that personal protective equipment is available and is in working order; and that appropriate training has been provided

- Determine the required levels of protective apparel and equipment by personnel occupying a laboratory at any time, and ensure sufficient protective apparel and equipment used are commensurate with any recognized hazards
 - Ensures that the facilities for, and proper training needed for, the use of hazardous equipment and materials being used in the laboratory, are adequate
- ◇ Is responsible for the periodic checking of safety equipment (eye washes, showers) not checked by other university officials.
 - ◇ Monitors procurement, use, and disposal of dangerous chemicals used in their laboratories.

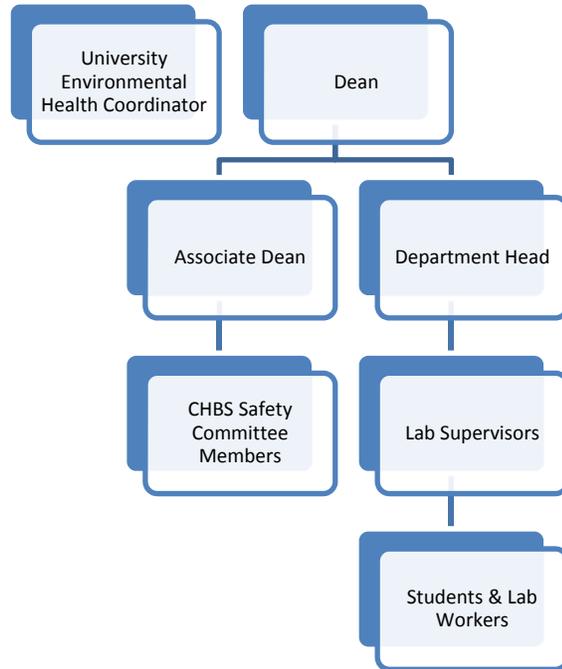
Students and Laboratory/Facility Workers

- ◇ Are responsible for planning and conducting all operations in accordance with this safety document, as directed by those persons in charge of the laboratory
- ◇ Develop good personal chemical hygiene and equipment safety habits as stated in this manual and in science laboratory/facility safety documents provided with course syllabi

University Environmental Health Coordinator

- ◇ Recommends policies and procedures and methods to ensure safe handling of hazardous materials and chemicals on campus through a comprehensive safety program administered through Risk Management.
- ◇ Ensures safe laboratory operations by university personnel through education and the inspection process
- ◇ Is responsible for the development and administration of Hazardous Waste Removal and other 'hazmat' programs for the university.
- ◇ Develops and implements programs, promotes and enforces university safety and environmental health policy

Organization of Responsibilities



VII. Regulations and Information Sources

The CHBS Facility Safety Plan was written to comply with these *United States Department of Labor (Occupational Safety & Health Administration) Regulations (Standards—29 CFR)*:

Part 1910 (OCCUPATIONAL SAFETY AND HEALTH STANDARDS)

Subpart A—General

1910.9—Compliance duties owed to each employee

Subpart I—Personal Protective Equipment (deemed commensurate with hazards associated with laboratory chemicals, instrumentation and equipment, e.g., safety glasses, face shields, gloves, foot protection)

Subpart K—Medical and First Aid

1910.151 Medical services and first aid
(with **Appendix A**)

Subpart S—Electrical (as applied to, but not limited to, machine shops, engineering and instrumentation laboratories)

1910.331 Scope

1910.332 Training

1910.333 Selection and use of work practices

1910.334 Use of equipment

1910.335 Safeguards for personal protection

Subpart Z—Toxic and Hazardous Substances

1910.1030 Blood borne pathogens (with **Appendix A**)

1910.1096 Ionizing radiation (as applied to, but not limited to, laboratories having X-ray devices, and facilities in which certain chemicals [e.g., uranyl acetate] are used and require disposal as hazardous chemical waste)

1910.1200 Hazard communication (with **Appendices A, B, and E**)

1910.1450 Occupational exposure to hazardous chemicals in laboratories
(with **Appendices A and B**)

An additional source for this document—addressing both chemical and equipment safety—was *Prudent Practices for Handling Hazardous Chemicals in Laboratories: Handling and Disposal of Chemicals*, published by the National Research Council (1995). An earlier (1981) publication of *Prudent Practices* was cited in the OSHA Laboratory Standard, specifically in Appendix A of Standard 29 CFR 1910.1450, because of “its wide distribution and acceptance and because of its preparation by members of the laboratory community through the sponsorship of the National Research Council.”

The OSHA Hazard Communication Standard (OSHA Standard 29 CFR 1910.1200) requires employers with hazardous chemicals in the workplace to provide information about those chemicals and safety training for their employees. Pertinent safety information will be provided to any outside contractors performing work in, and other visitors to, any CHBS research or classroom laboratories.

The World Health Organization provides information about several microbiological agents and diseases they cause:

<http://www.who.int/csr/resources/publications/csrapublications/en/index2.html>

On that page is a hyperlink to a publication entitled *Laboratory Safety Manual, 3rd Edition*:

http://www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/index.html

References

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Fuscaldò, A. A., A. J. Erlick and B. Hindman. *Laboratory Safety: Theory and Practice*. New York: Academic Press, 1980.

Muir, G.D. ed. *Hazards in the Chemical Laboratory*, London: The Chemical Society, 1977.

National Research Council, *Prudent Practices in the Laboratory: Handling and Disposal of Chemicals*, Washington: National Academy Press, 1995.

O'Brien, Paul. *Principles of Hazardous Material Management*. University of California Extension, Santa Cruz, 1993.

VIII. Bloodborne Pathogens Control Program

Introduction. The Occupational Safety and Health Administration (OSHA), in 1992, promulgated a standard, published as 29 CFR 1910.1030, pertaining to minimizing exposure to bloodborne pathogens in the workplace.

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10051

This standard pertains to job-related contact with blood or other body fluids (defined by OSHA as human semen, vaginal secretions, cerebrospinal fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any fluid visibly contaminated with blood, and indistinguishable body fluids).

In March, 1999, James Madison University published [Policy 3109](#) (*Bloodborne Pathogens*) to establish the Bloodborne Pathogens Control Program. This program “is designed to help prevent the spread of HIV (Human Immunodeficiency Virus) and HBV (Hepatitis B virus) infections to persons who may be reasonably expected to come into contact with blood and other body fluids as part of their work/activities.” OSHA defines an exposure incident as “a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials that results from performance of an employee’s duties.”

Because the university policy states that department heads of “at risk” personnel are responsible for developing and implementing exposure control plans, this program applies to all facilities within the College of Health and Behavioral Studies (CHBS).

University Resources. The (renamed) *CHBS Laboratory Bloodborne Pathogen Exposure Control Plan* is intended to parallel the James Madison University *Bloodborne Pathogens Policy Document 3109*:

<http://www.jmu.edu/JMUpolicy/3109.shtml> ,

The University Health Center offers information and training:

<http://www.jmu.edu/bbp/index.shtml> .

Identification of “At Risk” Personnel. A listing of those persons “who could be ‘reasonably anticipated,’ as a result of performing their job duties, to have contact with blood and other potentially infectious materials” will be kept by the CHBS Chemical Hygiene and Safety

Officer. This person will inform the heads of the departments to which these “at risk” personnel belong as to the need for annual bloodborne pathogen exposure control training.

Training. According to the *JMU Policy 3109: Bloodborne Pathogens (June 24, 2001 revision)*, all persons in “at risk” positions will be provided training by the university. This training program is two-fold:

- 1) Medical training is provided by the university health center, and will provide information about these topics:
 - What are bloodborne pathogens?
 - Who is at risk?
 - What is exposure?
 - How is an exposure incident handled?
 - How does the employee protect himself/herself?

- What is the nature of vaccines available, and when should one be vaccinated?

2) Departmental training for all persons in “at risk” positions must be conducted annually. Besides providing information pertaining to hazardous materials, location of the CHBS Safety Manual, and OSHA regulations pertaining to blood borne pathogen exposure, this exposure control plan will be reviewed. Topics will include:

- Definition of “at risk” positions for the college
- Description of specific job duties/tasks which place the employee at risk
- Description of proper performance of job duties to prevent disease transmission (e.g., hand washing, use of gloves)
- Description of work practice controls which are in place to reduce the likelihood of exposure (e.g., “sharps” disposal containers, biohazard bags)
- Description of hazard communication (e.g., warning labels)
- Description of personal protective equipment available in the college and its proper use (e.g., latex gloves)
- Description of decontamination and disposal procedures of personal protective equipment and infectious waste or materials (e.g., clean-up procedure, proper use of bleach)
- Description of other protective practices required by the college
- Reporting process for an exposure incident
- Discussion of engineering and work practice controls which may need to be examined and evaluated for their effectiveness

Maintenance of this program. The CHBS Safety Officer maintains this program. Heads of departments in the college, are periodically to inform those members of his/her faculty and staff about the program, and to refer those employees designated “at risk” for exposure to bloodborne pathogens for annual training.

The CHBS Safety Officer possesses “Bloodborne Pathogen Control Program” kits for both training purposes and for CHBS “at risk” personnel in case of possible bloodborne pathogen exposure.

Post-Exposure Evaluation and Follow-Up. As stated in the *JMU Policy 3109*, employees (whether “at risk” or other) will contact his/her designated supervisor to determine if an exposure incident is related to this bloodborne pathogen standard. If so, the supervisor will immediately contact and refer the employee to the Rockingham Memorial Hospital Emergency Room for medical evaluation. (Note that persons involved may sign a waiver refusing medical assessment and treatment.)

IX. Appendices

1. James Madison University Laboratory Incident Report
2. Sample Lab-Specific Sign
3. Content of Online Acknowledgement of Laboratory Responsibility and Training Form (ALRT)

James Madison University Laboratory Incident Report

Date: _____ Time: _____ Location: _____		
Date of report: _____		
Incident Type – injury, fire, near miss, etc. _____		
Name of person involved - print: _____		Sign: _____
Address room, apartment : _____		
building, street _____		
Telephone: _____	Cell: _____	E-mail: _____
Name of person reporting - print: _____		Sign: _____
Telephone: _____	Cell: _____	E-mail: _____
Name of witnesses - print: _____		Sign: _____
Telephone: _____	Cell: _____	E-mail: _____
Name of witnesses - print: _____		Sign: _____
Telephone: _____	Cell: _____	E-mail: _____

Incident

Description of Incident: _____

Corrective Actions Taken: _____

Additional Corrective Actions Planned: _____

Forward copies 131 West Grace Street, MSC 6703, Harrisonburg, Virginia, 22807
to: office of Risk (540) 568-7812, FAX: (540) 568-2878, Mooremg@jmu.edu, <http://www.jmu.edu/riskmtmt/>
Management

Lab/Facility Specific Safety Policy--ROOM XXX

This document outlines the policies specific to this lab. These policies supplement those outlined in the *CHBS Facility Safety Plan*, written for the College of Health and Behavioral Studies (CHBS). This document is available online at:

<http://www.jmu.edu/safetyplan/lab/????> .

Any person working in this lab is to have completed any necessary training and completing an online **Acknowledgement of Laboratory Responsibility and Training (ALRT)** form.

In case of emergency evacuation, immediately exit the lab through the nearest door and leave the building at the posted exit. Move away from the building and meet at the posted evacuation meeting location.

If you have any questions or concerns please contact the Lab/Facility Director, Academic Unit head, or CHBS Laboratory Safety Committee Representative for your department.

Lab/Facility Hazards & Concerns

- Flammables - use caution near open flames, heat, and sparks
- Poisons
 - avoid breathing fumes and accidental ingestion
 - use caution to minimize skin contact and spillage

{For specific information about possible hazards of a particular chemical, consult the Safety Data Sheet [SDS] for that chemical.}

CHBS Safety Policy Overview

- **Report all Injuries.** Medical treatment is to be received for cuts, burns, and fume inhalation.
- **Use safety glasses or goggles at all times** in all labs and in any area where chemicals are stored or handled.
- **Confine long hair and loose clothing.**
- **Use closed-toe shoes** to protect against broken glass, chemical spills, and dropped objects.
- **Do not eat, drink, chew gum, smoke or apply cosmetics** in the lab.
- **Wash hands** after handling chemicals or radioactive sources.

Lab/Facility Safety Policy Outline

- Label and date all stored samples and chemicals with your information (name, phone, e-mail) and a description of the contents
- Disposal policies
 - o Staff will notify students of special requirements for disposal
 - o Broken glass – Notify instructional staff and allow them to collect broken glass
 - o Hazardous waste – Notify staff

Lab/Facility Contacts

- Campus Police: (emergency) x86911 / 568-6911 (*off-campus*)
- Campus Police: (non-emergency) x86913 / 568-6913 (*off-campus*)
- Lab/Facility Director: x##### / XXXXX@jmu.edu
- Academic Unit Head: x##### / xxxxx@jmu.edu
- Department of xxxxx
- CHBS Laboratory Safety Committee Representative x##### / XXXXX@jmu.edu

X. CHBS Acknowledgement of Laboratory Responsibility and Training (ALRT)

This form must be submitted by all students enrolled in laboratory courses offered by the College of Health and Behavioral Studies (CHBS) and all faculty and staff of the college who work in these facilities. Submission of the form is your acknowledgement that you have reviewed the safety plan for the lab in which you will be working, have experienced safety training, and you are aware of your responsibilities.

Submission Date (Entered by System)

First Name:

Last Name:

Email:

Student/Employee ID Number:

Classification (Dropdown: Student, Faculty, Staff)

Laboratory: (Dropdown: List Areas)

CSD-Clinical (Applied Audiology Laboratory)

CSD-Human Audition Research

CSD-Animal Research

Health Sciences-Athletic Training, Health Assessment, Physician's Assistant, & Occupational Therapy

Health Sciences-Athletic Training

Health Sciences-Health Assessment

Health Sciences-Physician's Assistant

Health Sciences-Nutrition

Health Sciences-Occupational Therapy

Kinesiology (All Laboratories)

Nursing (All Laboratories)

Psychology-Animal/Neuroscience

Psychology-Health Psychology (Treadmill)

For students enrolled in a class:

Preface (Dropdown: ATEP, CSD, HTH, KIN, NUTR, NSG, OT, PA, PSYC):

Course Number (3 digits):

Section Number:

Instructor Last Name:

Semester: (Dropdown: Fall, Spring, Summer)

Year: (Dropdown: 2013, 2014, 2015)

Acknowledgments

1. Have you reviewed the safety manual for this laboratory:
Yes – No
2. Have you received instruction regarding safe laboratory practices and laboratory safety rules for this laboratory?
Yes -- No
3. Can you describe the personal protective equipment (such as apparel, shoes, eye protection, gloves) that is required while in this laboratory?
Yes -- No
4. Can you describe the location of emergency equipment in the laboratory (such as eye wash fountains, safety showers, first aid kits, fire extinguisher and Safety Data Sheets (SDS)) if available in this laboratory?
Yes – No
5. Have you received training in the appropriate use of the laboratory safety equipment available in this laboratory?
Yes – No
6. Do you know the location of the sign showing the emergency phone numbers for the laboratory?
Yes – No

Do NOT submit this form if your answer to any of these questions was “no,” or if you are uncertain about the correct answers. Instead, ask your instructor or laboratory supervisor for additional information, training or assistance.

By submitting this form you agree to adhere to the practices and procedures outlined in the safety plan for this laboratory and not engage in any activity for which you have not had appropriate training. You understand that failure to do so may result in losing your privilege of working in the laboratory even if this means not being able to successfully complete required courses.

SUBMIT