

Department of Medical & Research Technology

Allied Health Building 100 S. Penn Street, Baltimore, MD. 21201

SAFETY MANUAL



The information contained in this safety manual is a collection of different sections of Environmental Health and Safety (EHS), and UMB policies that have been modified to make it more applicable for the Department of Medical & Research Technology (DMRT). The Fire Evacuation Plan, Bloodborne Pathogens Plan and Chemical Hygiene Plan will be covered in this manual. Visit the EHS web site at <http://www.ehs.umaryland.edu> for additional information.

This manual contains information for DMRT faculty, staff, and undergraduate and graduate students.

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Part One

Fire Evacuation Plan

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I. INTRODUCTION

This evacuation plan establishes methods and procedures to be used in the event of a fire in the Allied Health Building. The emergency procedures outlined in this plan should be utilized during fires, and other emergencies. This plan deals primarily with fire emergencies. However, the same procedures and responsibilities would apply to other emergencies with appropriate variations. Faculty, staff, students, contractors, and visitors are expected to comply with the procedures contained within this document.

II. FIRE –LIFE SAFETY

The Department of Medical and Research Technology (DMRT) occupies the third and fourth floors of the Allied Health building, built in 1992 and located at 100 Penn Street. The facility has three fire-rated enclosed stairways, two of which are located in the northwest and southwest corners, with direct exit to the street. A third fire rated stairway is located in the center of the structure, exiting to the outside via the first floor lobby (see Floor plan in Appendix A).

A fire alarm system consisting of manual pull stations, audible/visible alarms, duct smoke detectors, elevator smoke recall detectors and heat detectors, sprinkler water flow and valve supervisory devices have been installed. This system transmits a signal to the Pine Street Police Station.

Fire department suppression equipment has access on the North, East, and South sides of the structure.

EMERGENCY NUMBERS

POLICE - 711

FIRE - 711

MEDICAL EMERGENCY - 711

Anyone discovering excessive heat, smoke, or fire will immediately sound an alarm and report the conditions by the following methods:

- 1. Manual Fire Alarm Pull Station Located Near Exits**
- 2. Telephone University Police - 711**

III. FIRE DRILLS

As required by the Maryland State Fire Prevention Code, regular fire drills to practice evacuation procedures outlined in this plan will be conducted in the Allied Health Building. Fire drills will be arranged, conducted, and supervised by the Office of Environmental Health & Safety through the University Fire Marshal. Fire drills will be unannounced to building occupants. University Police, Facilities Management, and the designee for the building will be notified of the drill and participate at their discretion. A complete evacuation of the building is expected during the fire drill.

IV. FIRE ALARMS

The fire alarm system installed in the Allied Health Building is directly connected to the communications center at the Pine Street Police Station, University of Maryland, Baltimore. Upon activation of an alarm, the Baltimore City Fire Department is immediately notified. The Office of Environmental Health & Safety, University Fire Marshal, and Facilities Management will respond to assist the fire department as needed.

All fires, even if extinguished or found extinguished, and all smoke or smell of smoke, must be reported to the fire department and the University Fire Marshal by the first person who discovers them (faculty, staff or student) by the following method:

1. Manually pull the fire alarm located near the closest exit.
2. Call the University Police to give them information about the situation in the building by dialing 711 and telling them all of the following information:
 - Name of person making call
 - Location (Allied Health Building)
 - Floor
 - Room number
 - People injured, trapped, or disabled, if any
3. Remain on the telephone until the message is confirmed.

V. BUILDING EVACUATION ASSIGNMENTS AND RESPONSIBILITIES: EMERGENCY WARDENS

Emergency Wardens will be appointed for each fire exit on each floor. When an alarm sounds, Wardens have the following responsibilities:

1. Conduct an orderly evacuation of their immediate area by directing occupants to the nearest unobstructed fire exit. **ELEVATORS SHOULD NOT BE USED.**

2. When it appears that the floor evacuation is nearly complete, the Warden will enlist the aid of a volunteer to conduct a search of their immediate floor to determine that all individuals have exited the area. For safety, the Warden and the volunteer will search as a team at all times. They will proceed from one fire exit to another until one of the following conditions have been met:
 - The entire floor or assigned area has been searched.
 - They encounter another search team and determine that the entire floor has been searched.
 - They encounter an unsafe condition requiring them to return to a previous fire exit.

When one of these conditions has been met, the Warden and volunteer will leave the floor using the nearest fire exit. The Warden will report the fire location, if known, the condition of the floor's fire exits and stairwells, and the location of any disabled persons to the Building Evacuation Supervisor.

It is critical that the Warden advises the Building Evacuation Supervisor of the presence of any disabled persons remaining in the fire stairwell on the floor.

3. The first Warden to reach the first floor lobby of the building will assume the responsibilities of the building Evacuation Supervisor, listed below.

Present DMRT Emergency Wardens:

| Floor | Fname | LName | PhoneNumber | Email | FaxNumber | Room # | Initial Training | Refresher Training |
|-------|---------|----------|-------------|--|------------|--------|------------------|--------------------|
| 3 | Joanne | Manning | 4107067728 | jmanning@som.umaryland.edu | 4107065229 | 340A | 8/25/04 | |
| 3 | Belzora | Joppy | 4107065158 | bjoppy@som.umaryland.edu | 4107065229 | 360 | | |
| 3 | Brian | Smith | 4107065200 | bdsmith@som.umaryland.edu | 4107065221 | 315 | 04/18/06 | |
| 4 | Shaw | Donna | 410-7063771 | dshaw@som.umaryland.edu | 4107060073 | 415-B | 8/1/07 | |
| 4 | Abe | Baalness | 4107065158 | abaalness@som.umaryland.edu | 4107060073 | 460 | 11/11/1997 | 03/19/2002 |

For an updated list visit the EHS website @:

<http://www.ehs.umaryland.edu/firesafety/Buildings/AlliedHlth/wardens.cfm>

**VI. BUILDING EVACUATION ASSIGNMENTS AND RESPONSIBILITIES:
BUILDING EVACUATION SUPERVISOR**

1. The Building Evacuation Supervisor will be stationed near the main exit of the building and record the reports of floor Wardens as they exit the building. Clipboards with checklists have been provided at each security guard desk for the use of the Building Evacuation Supervisor to record information.
2. Upon arrival of the Baltimore City Fire Department, the Building Evacuation supervisor will report the fire conditions, if known, and the location of persons with disabilities requiring evacuation from stairwells, if any.

VII. BUILDING EVACUATION ASSIGNMENTS AND RESPONSIBILITIES: UNIVERSITY FIRE MARSHAL

1. The University Fire Marshal provides liaison with the fire department incident commander and assists with keys, communications, fire alarm, and suppression equipment locations, and location of activation(s) within the building as needed.
2. Determines, in cooperation with the Operations & Maintenance electronics technicians, the cause of alarm activation.
3. When possible, follows-up to mitigate false alarms.
4. Coordinates the building evacuation with the Emergency Wardens and the Building Evacuation Supervisor during normal working hours.
5. Investigates fires to determine their cause.

VIII. BUILDING EVACUATION ASSIGNMENTS AND RESPONSIBILITIES: UNIVERSITY POLICE

1. The University police control the evacuation of building occupants outside the building by moving the occupants across the street or down the sidewalk away from the building when the alarm is sounding.
2. Directs and controls vehicular traffic to protect fire department personnel operating around apparatus and, if necessary, block streets and detour traffic as needed.
3. Assists building Emergency Wardens or the University Fire Marshal as needed to ensure evacuation of all building occupants.
4. Provides communications between the fire department and other University departments for needed resources.
5. Assists the fire department as needed.

IX. BUILDING EVACUATION ASSIGNMENTS AND RESPONSIBILITIES: FACILITIES MANAGEMENT

1. The facilities management personnel reports to the lobby of the building and provides assistance to the fire department as requested with keys, communications, and resources.
2. Identifies the source of the alarm and restores the fire alarm system to service.
3. Provides assistance with the sprinkler system and valves as needed. Restores the sprinkler system to service when necessary.
4. Provides assistance with elevators as needed.

X. BUILDING EVACUATION ASSIGNMENTS AND RESPONSIBILITIES: OCCUPANT EVACUATION PROCEDURES

If a fire is detected or the fire alarm sounds, evacuate the area, and follow the instructions of the Emergency Wardens. Isolate the fire by closing doors as you leave. Do not attempt to extinguish fires unless you have been trained on the proper use of portable fire extinguishers. Activate the nearest fire alarm, if it has not already been activated. Report the fire via the campus emergency number (**711**) using a University telephone in a safe area. Upon hearing a fire alarm, evacuate the building by marked stairs and exits, **DO NOT USE THE ELEVATORS**. Once outside the building stay out of the building and move across the street or down the sidewalk away from the building to clear access for the fire department and other emergency responders.

Assist persons with disabilities to the nearest unobstructed fire exit or stairwell. Disabled persons will remain in these fire safe locations until fire department personnel can assist them in exiting the building. A volunteer should remain in the fire exit or stairwell with the disabled person until fire department assistance arrives. Do not re-enter the building until expressly directed to do so by the fire officer in charge or the University Police.

XI. SAFE FIRE EVACUATION PRACTICES

In case of fire, activate the fire alarm before attempting to extinguish it. Only consider attempting to extinguish a fire if it is very minor AND you have been trained in the proper operation and use of portable fire extinguishers.

1. **Never use the elevators for evacuation of the building.**
2. Each floor of the Allied Health Building has three clearly marked exits. The stairwell at the north end of the building exits onto Lombard Street. The stairwell at the south end of the building exits into the alley between Penn Street Garage and the Allied Health Building. The remaining stairwell in the center of the building discharges directly into the first floor lobby and out the main entrance to the building. All exits are clearly marked by illuminated exit signs.
3. Evacuate in a calm, orderly manner - don't panic. Walk, don't run.
4. Know the location of fire extinguishers, how to operate them, and on what type of fires they should be used.
5. Obey the directions of your building Emergency Wardens and emergency response officials.
6. **Stay in a single file in the stairways**, as fire department personnel may be coming up the same stairway.
7. Before opening any door of a room or office that leads to the main hallway first feel the door to see if it is hot. If the door is not hot, open it slowly. Then if conditions allow, proceed to the nearest stairway and follow the evacuation plans. If smoke is too heavy or all exits from a floor are blocked, return to the nearest room or office with a phone. Close the door; and place a towel or article of clothing along the bottom edge of the door. The windows in the AHB can not be opened, so **DO NOT BREAK** the glass. Try to remain calm, and call **711** to advise emergency personnel of your location and situation, then wait for the fire department to assist you.

XII. DAILY FIRE SAFETY PRACTICES

Every employee, faculty member and student is responsible for assisting in maintaining an environment within the University of Maryland, Baltimore that is free of fire and evacuation hazards. The following information will help ensure fire prevention and safe evacuations from UMB buildings.

1. Respect the NO SMOKING policy within all University buildings including exit stairwells.
2. Keep all exit corridors free of combustible storage and maintain a clear 44" minimum width in all business and lab corridors and 72" in all classroom areas to ensure a timely and safe evacuation of all buildings during an emergency. This will also allow for safe access to the fire area by firefighters.
3. Be familiar with all exit locations and fire evacuation routes within your assigned area(s) of the building.
4. Participate in fire drills so that you become familiar with proper procedures in case of an emergency.
5. Do not prop open fire and smoke doors. These doors are designed to restrict the movement of fire and smoke within a building so that occupants can evacuate safely during an actual emergency.
6. Report any unsafe condition within your building or any safety equipment that is not functioning properly, such as:
 - Locked exit doors
 - Blocked corridors
 - Combustible storage in corridors
 - Burned out exit lights
 - Emergency lighting not working
 - Fire alarm components not functioning

These conditions should be reported as soon as possible (ASAP) to the Environmental Health and Safety office at **6-3490**. Any questions concerning fire safety within University buildings should also be directed to the Campus Fire Marshal at **6-3494**.

Part Two

BLOODBORNE PATHOGEN EXPOSURE CONTROL PLAN

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I. INTRODUCTION

Certain job activities at DMRT, University of Maryland School of Medicine have the potential for employee exposure to human blood and/or body fluids. Human blood, other body fluids, and unfixed human tissues are potential sources of harmful and lethal diseases such as Hepatitis B and Acquired Immunodeficiency Syndrome (AIDS). Identification of infectious body fluids and human tissues requires considerable medical diagnostic efforts. Therefore, to minimize the risk of occupational exposure to potentially contaminated blood and body fluids a combination of employee and student education, personal protective equipment (PPE), vaccinations, engineering controls, and application of recommended work practices will be used. The following Exposure Control Plan has been developed in accordance with the Occupational Safety and Health Administration's (OSHA) Bloodborne Pathogen Standard, 29 CFR 1910.1030.

II. DEFINITIONS

Bloodborne Pathogens refers to any pathogenic microorganisms present in human blood that are capable of causing disease in humans. These pathogens include, but are not limited to, Hepatitis B (HBV) and Human Immunodeficiency (HIV) Viruses.

Exposure Incident is defined as a specific eye, mouth, other mucous membrane, non-intact skin, or parenteral contact with blood or other potentially infectious materials resulting from the performance of the individual's duties or assignments.

Occupational Exposure is defined as reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or **Other Potentially Infectious Materials (OPIM)** that may result from the performance of the individual's duties or assignments.

Other Potentially Infectious Materials (OPIM), as referenced by the OSHA Bloodborne Pathogen Standard, are defined as: (i) the following human body fluids (in liquid or dried state): semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva (in dental procedures only), any body fluid or material visibly contaminated with blood, and all body fluids in a situation where it is difficult to differentiate between types of body fluids; (ii) any unfixed tissue or organ (excluding skin) from a human (living or dead); (iii) HIV-containing cell or tissue cultures, organ cultures, and HIV or HBV-containing culture media or solutions; (iv) blood, tissues, or cultures from animals experimentally infected with HIV or HBV or other bloodborne pathogens.

Personnel means (i) part-time and full-time students of DMRT, as well as any special students who are not registered; (ii) employees including full-time, part-time, temporary, contractual, and visiting personnel in any employment category; and (iii) volunteers participating in activities.

Personal Protective Equipment (PPE) are specialized clothing or equipment worn by University personnel for protection against potentially infectious materials as well as the spread of contamination of these materials.

Sharps with Engineered Sharps Injury Protections (SESIPs) are defined as "a nonneedle sharp or a needle device used for withdrawing body fluids, accessing a vein or artery, or administering medications or other fluids, with a built-in safety feature or mechanism that effectively reduces the risk of an exposure incident.

Standard Precautions are recommended by the Centers for Disease Control (CDC). Standard Precautions apply to ALL blood and body fluids, except sweat, and consider ALL of these substances potentially infectious whether or not they contain visible blood

Universal Precautions are an approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV, and/or other bloodborne pathogens.

Work Practice Controls refer to controls that reduce the likelihood of exposure by altering the manner in which a task is performed.

III. EXPOSURE DETERMINATION

OSHA requires employers to perform an exposure determination concerning which employees may have occupational exposure to blood or OPIM. The exposure determination is made without regard to the use of personal protective equipment (i.e., employees are considered to be exposed even if they wear personal protective equipment). The exposure determination should identify job classifications in which all employees may be expected to have such occupational exposure, regardless of frequency.

The following personnel perform procedures or other job- related tasks that carry an inherent potential risk for mucus membrane or skin contact with blood, body fluids or tissues, or potential for spills or splashes:

- Faculty
- Undergraduate/ Graduate students
- Laboratory technician staff

IV. METHODS OF COMPLIANCE

OSHA requires that this plan include a schedule and method of implementation for the various requirements of the standard.

Standard precautions: The Centers for Disease Control (CDC) Standard Precautions will be observed at the DMRT to prevent contact with blood or other potentially infectious materials. All blood or OPIM will be considered infectious regardless of the perceived status of the source individual.

Engineering controls: Engineering and work practice controls will be utilized to eliminate or minimize exposure to employees at DMRT. Where occupational exposure remains after institution of these controls, personal protective equipment must also be utilized. The following engineering controls will be utilized:

Specimen Containers: Containers for specimens of blood or OPIM must be designed to prevent leakage during collection, handling, and storage. They are to be inspected for leakage prior to use and on

a daily basis. Avoid contaminating the outside of the container. Be sure the lid is on tight. Decontaminate the outside of the container with 10% bleach solution (made at minimum monthly) or its equivalent before transporting. To make a 10% bleach solution, add one part commercial bleach (5.25% available chlorine) to nine parts water. All specimen containers must be clearly labeled as to contents, labeled with a biohazard label, and then double containerized for transport.

Containers for Special Medical Waste: Special Medical Waste (SMW) such as used microbiological cultures, materials contaminated with microbiological materials, blood soiled articles, and human body fluids must be collected in closed containers that can hold all contents without leakage during handling, storage and transport. SMW containers must be clearly labeled with the universal biohazard symbol. DMRT Technical Staff will provide containers for collection and storage of SMW through EHS (410-706-7207). Contact DMRT technical staff for pick-up and disposal.

Sharps Containers: Sharps include syringes, needles, slides, scalpels, cover slips, glass pipettes, and broken glass that may be contaminated with infectious materials. Sharps containers should be leakproof, puncture resistant, labeled with the universal biohazard symbol, and closeable. Full sharps containers must be treated with 10% bleach solution or be autoclaved and placed in a properly lined biohazard burn box prior to their disposal via EHS. Contact DMRT technical staff for pick up and disposal.

V. STUDENT LABORATORY DRESS CODE

A student dress code in the student laboratories is enforced to ensure the personal safety of all students. Students in violation of these policies will not be permitted to participate in laboratory exercises.

- Male students must wear long pants or scrubs with pockets. Socks are required when wearing pants or scrubs to cover legs below the hemline.
- Female students must wear pants, scrubs with pockets or skirts resting below the knee. Socks are required when wearing pants or scrubs; socks, stockings or hose are required when wearing a skirt to cover legs below the hemline.
- Cloth, open-toed or perforated shoes are not permitted in the laboratories.
- Hairstyles which extend below the shoulder must be tied back.
- Jewelry must be limited; long necklaces, dangling bracelets or earrings extending below the jaw line are not permitted.

Clinical Practicum Dress Code

As professional representatives of the Department and the University of Maryland, students on clinical rotation or externship must adhere to the established dress code guidelines for the specific facility. In addition to observing the guidelines of the practicum site, students must adhere to the following minimum guidelines of the Department of Medical and Research Technology:

- Appearance is to be neat and clean, and demonstrate the use of good hygiene at all times.
- Clothing should be clean, free from tears and not wrinkled or tattered.
- Male students must wear long pants or scrubs with pockets. Socks are required when wearing pants or scrubs to cover legs below the hemline

- Female students must wear pants, scrubs with pockets or skirts resting below the knee. Socks are required when wearing pants or scrubs; stockings or hose are required when wearing a skirt to cover legs below the hemline.
- T-shirts, sweat shirts, strapless tops, mid-drifts, halter-tops, tube tops and tops with plunging necklines are not permitted. Shirts with a collar are recommended.
- Miniskirts, shorts, blue jeans, sweatpants and running pants are not permitted.
- Cloth, open-toed or perforated shoes are not permitted.
- Hairstyles which extend below the shoulder must be tied back.
- Jewelry must be limited; long necklaces, dangling bracelets or earrings extending below the earlobes are not permitted.

During clinical rotations/externships, students must adhere to the established dress code guidelines of the specific laboratory. Students should consult with the affiliate institution for site specific information. Instances when a student does not conform to the dress code will result in appropriate disciplinary action, including removal from their rotation.

VI. PERSONAL PROTECTIVE EQUIPMENT (PPE)

Personal protective equipment (PPE) used at the DMRT is provided to faculty, staff, and students. PPE is chosen based on the anticipated exposure to blood or OPIM. Protective equipment will be considered appropriate only if it does not permit blood or OPIM to pass through or reach the individual's clothing, skin, eyes, mouth, or other mucous membranes under normal conditions of use and for the duration of time which the protective equipment will be used.

The DMRT technical staff will ensure that appropriate PPE in the appropriate sizes is readily accessible at the work site or is issued without cost to faculty, staff, and students. Hypoallergenic gloves, glove liners, powder free gloves or other similar alternatives will be readily accessible to those who are allergic to the gloves normally provided. Faculty will ensure that appropriate PPE is available for students during student laboratory exercises. All Principal Investigators (PIs) will ensure that appropriate PPE is available for their research staff, including undergraduate and graduate students.

Protective Equipment should be removed before leaving the work site and either be stored or disposed of appropriately. Students should hang their PPE gowns on the hooks provided in the student laboratories.

The following pieces of PPE must be available and used when there is potential for exposure to bloodborne pathogens:

Gloves: Disposable, single-use latex or nitrile gloves must be worn when it is reasonably anticipated that faculty, staff or students will have hand contact with blood or other potentially infectious materials, when collecting and processing human specimens and when handling or touching contaminated items or surfaces.

Disposable gloves used at the DMRT are not to be washed or decontaminated for reuse and are to be replaced as soon as practical when they become contaminated or as soon as feasible if they are torn, punctured, or when their ability to function as a barrier is compromised. Utility gloves will be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised. Check gloves for leaks prior to wearing them. If gloves are

damaged (torn or punctured) or become damaged or contaminated during a procedure, replace them. Wash hands with soap and water for 30 to 60 seconds immediately after removing gloves.

Clothing: Protective clothing must be worn when there is a risk of body fluids splattering or becoming aerosolized and contacting a faculty, staff or student's skin or clothing. Protective clothing should be resistant to fluids and may be disposable or reusable. Reusable clothing must be properly laundered prior to reuse.

Face Protection: Face shields are required for all procedures that may spray, splatter or aerosolize blood or other potentially infectious material. Masks in combination with eye protection devices, such as goggles or glasses with solid side shields, or chin length face shields, are required to be worn when splash, spray, or aerosolized blood or OPIM may contact eye, nose, mouth or mucous membranes.

Eyewear: DMRT students in all laboratory sessions will wear protective eye-wear at all times except when using the microscope, performing phlebotomy, or at the discretion of the instructor.

VII. WORK PRACTICE CONTROLS

Work Practice Controls: Work Practice Controls are procedures that reduce the risk of occupational exposure by altering the way a task is performed. The following work practice controls are to be followed by all faculty, staff or students when working with human blood or OPIM.

Hand washing: After the removal of personal protective gloves, faculty, staff or students must wash their hands and any other potentially contaminated skin area immediately or as soon as feasible with soap and water. If faculty, staff or students' skin or mucous membranes become contaminated then those areas must be washed or flushed with soap and water as soon as feasible following contact.

Needles and Sharps: Contaminated needles and other contaminated sharps must not be bent, recapped, removed, sheared or purposely broken. OSHA allows an exception to this if the procedure would require that the contaminated needle be recapped or removed and no alternative is feasible and the action is required by the medical procedure. If such action is required then the recapping or removal of the needle must be done by the use of a mechanical device or a one handed technique. Procedures which require recapping of needles are discouraged.

Personal hygiene: Applying cosmetics and handling contact lenses in the laboratory is forbidden at all times. Hands are to be washed with soap and water before leaving the work site.

Food and drink: Food and drink are never to be stored, consumed, or disposed of in a laboratory.

Handling of Materials: Packages marked with the universal biohazard symbol or otherwise identified as containing potentially infectious materials are to be inspected for leaks immediately upon arrival at DMRT.

All procedures are to be conducted in a manner that will minimize splashing, spraying, splattering, and generation of droplets of blood or OPIM. Specific methods include the use of protective clothing, gloves, chin length face shields, eye protection, and the use of work gloves to protect latex/ nitrile gloves from abrasion and tearing when large items are handled.

Handle sharp objects with safety awareness. Maintain eye contact with the item. Shield machines that splash and splatter. Use capped tubes and safety caps when vortexing and centrifuging. Wrap cotton or a gauze pad moistened with disinfectant around rubber stoppers or lyophilized containers when opening them. To the extent possible, perform all procedures that could aerosolize material in a biological safety cabinet.

Specimens of blood or OPIM are to be placed in a container that prevents leakage during the collection, handling, processing, storage, and transport of the specimens. The container used for this purpose will be labeled in accordance with the requirements of the OSHA standard. Faculty, PI's or technical staff will ensure that all equipment has been decontaminated prior to servicing and shipping.

All specimen container(s) must be placed within a secondary container that is leak-proof and clamped to prevent spillage of infectious materials. The outer container must have a biohazard label and content information. The outer container should be decontaminated with 1:10 dilution of chlorine bleach.

Specimen collection: When collecting specimens, never force liquid into a vacuum tube container.

VIII. HOUSEKEEPING

Routine Cleaning: All areas of the worksite must be maintained in a clean and sanitary condition. All counters must be disinfected with 10% chlorine bleach solution (or its equivalent) at least daily and immediately following completion of procedures involving human blood and OPIM.

Contaminated Work Surfaces: All work surfaces must be decontaminated with a 10% bleach solution after completion of procedures involving and/or immediately following any spill of blood or OPIM. Recommended contact time for effective decontamination is 20-30 minutes.

Broken Glass: Broken glass must never be picked up by hand. Recommended mechanical means of clean up include use of a brush and dustpan, tongs or forceps. Utensils must be cleaned and decontaminated immediately after use. The contaminated glass should be disposed of in a sharps container and decontaminated ones should be deposited into boxes labeled "Deposit Glass Here".

Contaminated Sharps: Sharps must be placed in a properly marked sharps container and labeled with a biohazard symbol. Containers for contaminated sharps must be easily accessible to faculty, staff, and students and located in each separate procedure area. The containers must be maintained upright throughout their use and replaced as needed and must not be overfilled. When moving containers of contaminated sharps from the area of use, the containers must be closed immediately prior to removal. The sharps container must be placed in a plastic bag-lined biohazard burn box. Contact DMRT technical staff for pick-up and disposal.

Laundry: Contaminated protective gowns are to be placed in a biohazard bag and given to the technical staff. Home laundering is not permitted. Contact DMRT technical staff for assistance.

The above controls will be examined and maintained on a regular schedule. The effectiveness of the controls will be reviewed annually and updated as needed.

IX. STANDARD OPERATING PROCEDURES

To achieve the goals of this policy, Standard Operating Procedures (SOPs) must be developed for activities in which an employee or student may be exposed to bloodborne pathogens.

The procedure must contain the following elements:

- A clear and descriptive position description
- The names and jobs classifications of all individuals that will participate in the bloodborne pathogen activities.
- Identification of the area where duties are performed and a description of the procedures to be used to prevent unauthorized personnel from being exposed to a potential hazard.
- A listing of the possible sources of exposure to bloodborne pathogens or other potentially infectious materials in the specific task or procedure. (Note: All liquids or media that come into contact with blood, unfixed human tissue or human cell lines are to be considered potentially infectious material until the source tissue has been disinfected.)
- A detailed description of the task or procedure including all of the applicable safety precautions detailed in the Exposure Control Plan.
- Identification of the departmental point of contact for exposure incidents.

X. HEPATITIS B VACCINATION PROGRAM FOR FACULTY AND STAFF

The University of Maryland Baltimore offers the HBV vaccination series to all faculty and staff who have occupational exposure, and post-exposure follow-up to faculty and staff who have had an exposure incident. All medical evaluations and procedures including the Hepatitis B vaccination series and post-exposure follow-up (including prophylaxis) will be available to faculty and staff at a reasonable time and place. These will be performed by or under the supervision of a licensed physician or other licensed health care professional according to the recommendations of the U.S. Public Health Service.

The HBV vaccination is offered by the university at no cost to all faculty and staff who have potential occupational exposure. Laboratory tests to establish antibody titer will be conducted by an accredited laboratory at no cost to faculty or staff.

Any personnel, who are neither students nor employees, but have occupational exposure, will be offered the HBV vaccine and vaccination at their own expense.

Hepatitis B vaccination will be made available:

- After faculty or staff have received training in occupational exposure (see Information and Training);
- Within 10 working days of initial assignment;

- To all faculty or staff who have occupational exposure unless they have previously received the complete Hepatitis B vaccination series, or antibody testing has revealed that they are immune, or the vaccine is contraindicated for medical reasons.

Participation in a pre-screening program will not be a prerequisite for receiving Hepatitis B vaccination. If an individual initially declines Hepatitis B vaccination but at a later date (while still covered under the standard) decides to accept the vaccination, the vaccination will then be made available. All faculty or staff who decline the Hepatitis B vaccination offered should sign the OSHA required waiver indicating their refusal. All faculty and staff may be vaccinated at the Student and Employee Health Office (SEH).

If a routine booster dose of Hepatitis B vaccine is recommended by the CDC at a future date, such booster doses will be made available.

Routine laboratory tests for titer or hepatitis B vaccinations will be billed to the department.

XI. POST-EXPOSURE EVALUATION AND FOLLOW-UP FOR FACULTY AND STAFF

Cost: Post exposure testing and follow-up activities for faculty or staff are billed to Workman's Compensation.

All exposure incidents must be reported, investigated, and documented (see Accident & Injury report form in Appendix B). **Faculty or staff with potential exposure must call the Student and Employee Health Clinic at 410-328-6791 immediately after exposure. If no one is available at that number please call the beeper number 410-512-0021.** Faculty or staff may be advised to report to the Student and Employee Health office located at 29 South Paca St. for the initiation of evaluation for Post-Exposure Prophylaxis (PEP). The hours of operation of the Student and Employee Health Office are: Monday and Thursday, 8:00 AM to 6:00 PM or Tuesday, Wednesday and Friday, 8:00 AM to 4:30 PM. If exposure occurs after student health office hours then faculty and staff are advised to report to the UMMS emergency department for initiation of evaluation of PEP. Current CDC guidelines call for initiation of medical treatment of high-risk exposures within 2 hours.

Protocol for Action After an Exposure Incident such as a Needlestick or Splash:

1. If the exposure causes an abrasion or puncture wound, wash the affected area with soap and water. Do not pour bleach or alcohol over the area.
2. If the exposure causes blood or bodily fluids to get into the eye area, irrigate the eye with one liter of fluid. Do this immediately as this will wash the foreign substance from the eye. There are eye wash stations within every laboratory in DMRT.
3. If there are blood or body fluid splatters to the face or arm areas, wash those areas with soap and water.
4. Call the Student and Employee Health Clinic at 410-328-6791 immediately after steps 1, 2, or 3 if exposure occurs during clinic hours or report to the UMMS emergency department to initiate evaluation for PEP treatment.
5. The faculty or staff member must complete an Accident & Injury Report Form and notify the DMRT Interim Administrator at 410-706-7075 within 24 hours.

Following a report of an exposure incident, the exposed individual must receive a confidential medical evaluation and follow-up, including at least the following elements:

- Documentation of the route of exposure and the circumstances under which the exposure incident occurred.
- Identification and documentation of the source individual, unless it can be established that identification is infeasible or prohibited by state or local law.
- The source individual's blood will be tested as soon as feasible after consent is obtained to determine HBV and HIV infection. If consent is not obtained, the person responsible for the Hepatitis B vaccination program will establish that legally required consent cannot be obtained. When the source individual's consent is not required by law, the source individual's blood, if available, will be tested and the results documented.
- When the source individual is already known to be infected with HBV or HIV, testing for the source individual's HBV or HIV status need not be repeated.
- Results of the source individual's testing must be made available to the exposed individual along with information on applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.

Collection and testing of blood for HBV and HIV serological status will comply with the following:

- The exposed individual's blood will be collected as soon as feasible and tested after consent is obtained.
- The exposed individual will be offered the option of having their blood collected for testing of HIV/HBV serological status. The exposed individual **MUST** have a blood test for HIV if the source patient consents for testing.

All DMRT faculty or staff who experience an exposure incident will be offered post-exposure evaluation and follow-ups in accordance with the OSHA standard. The health care professional responsible for the person's Hepatitis B vaccination and post-exposure evaluation will be provided with the following:

- A copy of 29 CFR 1910. 1030. <http://www.osha.gov>
- A written description of the exposed individual's duties as they relate to the exposure incident.
- Written documentation of the route of exposure and circumstances under which exposure occurred.
- Results of the source individual's blood testing, if available.
- All medical records relevant to the appropriate treatment of the person including vaccination status.

Individuals will be provided a copy of the evaluating health care professional's written opinion within 15 days of the completion of the evaluation.

The health care professional's written opinion for HBV vaccination must be limited to whether HBV vaccination is indicated and if the individual has received such vaccination. It will include a statement that the individual has been informed of the results of the evaluation and of any medical conditions resulting from exposure to blood or OPIM, which require further evaluation or treatment. All other findings or diagnosis must remain confidential and will not be included in the written report.

XII. STUDENT VACCINATION REQUIREMENTS

The University of Maryland Baltimore strives to be a model health promoting campus and to support the health of its students and the people of the community with whom they come in contact. All students, both full- and part-time, who wish to qualify for enrollment at the University must satisfy the University's immunization requirements. **All costs of student compliance with the immunization requirements are the responsibility of the student.**

Immunization Requirements

- A. A report of Medical History form which includes an immunization history will be mailed to all new students and must be completed and returned to **Student Health (not DMRT) prior to** the student's initial registration.
- B. All incoming students are required to provide to the satisfaction of Student Health:
 - 1. Proof of immunization for Measles, Mumps, and Rubella (students born before 1957 are considered immune to measles).
 - 2. Certification of Varicella (chicken pox) immunity by a
 - a. history of disease;
 - b. proof of vaccination or
 - c. by way of a positive titer.
- C. Evidence of immunization against tetanus/diphtheria within the past 10 years.
- D. Tuberculosis
Incoming students must provide the results of 2 tuberculosis screening tests that have been performed 3 months apart within 12 months of the date of the student's enrollment. Student Health will be working with new students who only have proof of 1 TB test to comply with this new standard. Current students must provide the results of one annual TB test. Screening must show a negative PPD test or, if the PPD is positive, a negative chest X-ray report.
- E. Hepatitis Immunization
As referenced by the DMRT Student Handbook, students who wish to enroll in DMRT degree or certificate programs must be immunized against Hepatitis B. **The Hepatitis B series must be initiated during the first semester of enrollment.**

F. Meningitis

All students who live on-campus student housing must receive a vaccination for meningococcal disease or sign a waiver stating that the student has received and reviewed information provided by the University about meningococcal disease and has chosen not to be vaccinated.

To participate in clinical training at non-university sites students must comply with the health and immunization requirements of the training sites.

***Those students not adhering to University policy governing immunizations will not be allowed to register for subsequent semesters or to advance to their practicum.**

Waivers

Immunizations required by law or mandated by a UMB school or program will not be waived. For example, the requirement for immunization against Hepatitis B cannot be waived by students in the medical and research technology program.

In other cases, a student may receive a waiver on health grounds if he/she presents a written statement from a licensed physician or a local deputy state health officer indicating that immunization against any or all of the diseases for which immunization is required, is medically contraindicated, detrimental to, or not in the best interest of the student. The physician's statement must state whether the contraindication is permanent or temporary and, if temporary, provide assurance that the student will receive immunization(s). The student subsequently must furnish evidence of completion of immunization at the first reasonable opportunity. In the absence of such evidence, the student will not be allowed to register.

Any student who objects to immunization upon grounds that immunization conflicts with his or her bona fide religious beliefs and practices may request a religious waiver. A waiver on religious grounds may be obtained by submitting a written request to Student Health. This waiver will not apply in case of an emergency or epidemic of disease that is declared by the Secretary of Health and Mental Hygiene or the Secretary's designee. Students requesting religious waivers should refer to this policy and contact their School or program for possible curricular implications.

XIII. MEDICAL TREATMENT FOR DMRT STUDENTS

Cost: All costs for medical treatment or post exposure evaluation and follow-up activities for students are the responsibility of the student. All full time DMRT students are required to have health insurance and the insurance will be billed for all medical services.

For medical attention during class hours, students should notify the faculty and then report to the Campus Health Service, 29 South Paca, phone (410) 328-6791. When on clinical rotations/externships, supervisory personnel should be consulted as to the procedure following illness or accident; or the student's private physician should be consulted.

ALL ACCIDENTS MUST BE REPORTED TO THE FACULTY MEMBER IN CHARGE OF THE LABORATORY AND AN ACCIDENT AND INJURY INCIDENT REPORT FORM (SEE APPENDIX B) MUST BE FILED IN THE DEPARTMENT BY THE FACULTY MEMBER. ACCIDENTS IN THE AFFILIATE LABORATORIES MUST BE DOCUMENTED ACCORDING TO THE AFFILIATE'S INSTITUTIONAL POLICIES.

XIV. POST-EXPOSURE EVALUATION AND FOLLOW-UP FOR STUDENTS

All exposure incidents that occur for students must be reported, investigated, and documented (see Accident & Injury report form in Appendix B).

Exposure at DMRT

When a DMRT student has an exposure incident at DMRT, the student must report it to the faculty responsible for the course or research activities. **The faculty member must call the Student and Employee Health Clinic at 410-328-6791 immediately after exposure. If no one is available at that number, please call the beeper number 410-512-0021.** The student may be advised to report to the Student and Employee Health office located at 29 South Paca St. for the initiation of evaluation for Post-Exposure Prophylaxis (PEP). The hours of operation of the Student and Employee Health Office are: Monday, and Thursday, 8:00 AM to 6:00 PM or Tuesday, Wednesday and Friday, 8:00 AM to 4:30 PM. If exposure occurs after student health office hours then the student is advised to report to the UMMS emergency department for initiation of evaluation for PEP. Current CDC guidelines call for initiation of medical treatment of high-risk exposures within 2 hours.

Protocol for Action After an Exposure Incident such as a Needlestick or Splash:

1. If the exposure causes an abrasion or puncture wound, wash the affected area with soap and water. Do not pour bleach or alcohol over the area.
2. If the exposure causes blood or bodily fluids to get into the eye area, irrigate the eye with one liter of fluid. Do this immediately as this will wash the foreign substance from the eye. There are eye wash stations within every laboratory in DMRT.
3. If there are blood or body fluid splatters to the face or arm areas, wash those areas with soap and water.
4. Call the Student and Employee Health Clinic at 410-328-6791 immediately after steps 1, 2, or 3 if exposure occurs during clinic hours or report to the UMMS emergency department to initiate evaluation for PEP treatment.
5. The faculty member must complete an Accident & Injury Report Form and notify the program director within 24 hours.

Exposure at Affiliates of DMRT

If a DMRT student has an exposure incident at an affiliate laboratory the student must inform that laboratory's Education Coordinator or the immediate supervisor to begin the post exposure follow-up procedure. Some affiliate laboratories will perform the testing of both the student and the source individual's blood. However, other affiliates may send the student back to UMB for all testing. It is important that ALL students know the affiliates' policy concerning student exposure to bloodborne pathogens PRIOR to an incident occurring. If a student has an exposure incident at a UMMS laboratory, then the student must also call the **Bloodborne Pathogen Exposure Hotline at 410-328-2337 then enter Page ID 7845#.**

THE DMRT MUST BE NOTIFIED IMMEDIATELY OF ANY INCIDENT/ACCIDENT INVOLVING A STUDENT DURING THEIR LABORATORY PRACTICUM. AN INCIDENT FORM MUST BE FILED IN THE STUDENT'S RECORD.

Following a report of an exposure incident, the exposed student must receive a confidential medical evaluation and follow-up, including at least the following elements:

- Documentation of the route of exposure and the circumstances under which the exposure incident occurred.
- Identification and documentation of the source individual, unless it can be established that identification is infeasible or prohibited by state or local law.
- The source individual's blood will be tested as soon as feasible after consent is obtained to determine HBV and HIV infection. If consent is not obtained, the person responsible for the Hepatitis B vaccination program will establish that legally required consent cannot be obtained. When the source individual's consent is not required by law, the source individual's blood, if available, will be tested and the results documented.
- When the source individual is already known to be infected with HBV or HIV, testing for the source individual's HBV or HIV status need not be repeated.
- Results of the source individual's testing must be made available to the exposed student along with information on applicable laws and regulations concerning disclosure of the identity and infectious status of the source individual.

Collection and testing of blood for HBV and HIV serological status will comply with the following:

- The exposed student's blood will be collected as soon as feasible and tested after consent is obtained.
- The exposed student will be offered the option of having their blood collected for testing of HIV/HBV serological status. The exposed individual **MUST** have a blood test for HIV if the source patient consents for testing.

All DMRT students who experience an exposure incident will be offered post-exposure evaluation and follow-ups in accordance with the OSHA standard. The health care professional responsible for the person's Hepatitis B vaccination and post-exposure evaluation will be provided with the following:

- A copy of 29 CFR 1910. 1030. <http://www.osha.gov>
- A written description of the exposed individual's duties as they relate to the exposure incident.
- Written documentation of the route of exposure and circumstances under which exposure occurred.
- Results of the source individual's blood testing, if available.

- All medical records relevant to the appropriate treatment of the person including vaccination status.

The exposed student will be provided a copy of the evaluating health care professional's written opinion within 15 days of the completion of the evaluation.

The health care professional's written opinion for HBV vaccination must be limited to whether HBV vaccination is indicated and if the student has received such vaccination. It will include a statement that the student has been informed of the results of the evaluation and of any medical conditions resulting from exposure to blood or OPIM, which require further evaluation or treatment. All other findings or diagnosis must remain confidential and will not be included in the written report.

XV. COMMUNICATION OF HAZARDS TO EMPLOYEES

Labels: Warning labels need to be placed on containers of regulated waste, refrigerators, freezers, incubators or other containers that contain blood or OPIM. They also need to be placed on containers used to transport regulated materials and required for any equipment that can reasonably be expected to become contaminated during the course of its use.

The warning label must contain the word "Biohazard" along with the universal biohazard symbol and printed in fluorescent orange or orange-red color with lettering or symbols in a contrasting color.

Signs: Signs will be posted at the entrance to work areas in which infectious and potentially infectious materials are used. Required signs will be fluorescent orange in a contrasting color and they must contain the following information:

- The universal biohazard symbol.
- The name of infectious agent (if any);
- Special requirements for entering the area;
- Name and day/night time telephone numbers of the laboratory supervisor and/or other responsible person(s).

XVI. INFORMATION AND TRAINING

Training is required for all DMRT faculty and staff who may have exposure to bloodborne pathogens in the course of their employment, studies, or volunteers effort. Training is provided at the time of initial assignment to tasks where occupational exposure may occur and shall be repeated within twelve months of the previous training. Students will receive training during MEDT 321 Introduction to Laboratory Techniques.

Training must be tailored to the education and language level of the personnel, provided at no cost to the personnel, and during the normal work shift. The training will be interactive and cover the following:

- The Bloodborne Pathogen Standard and its contents
- The epidemiology and symptoms of bloodborne diseases

- The modes of transmission of bloodborne pathogens
- The Bloodborne Pathogen Exposure Control Plan, and a method for obtaining a copy
- The recognition of tasks that may involve exposure
- The use and limitations of methods to reduce exposure, for example engineering controls, work practices, and PPE
- The types, use, location, removal, handling, decontamination, and disposal of PPE
- The basis of selection of PPE
- The Hepatitis B vaccination, including efficacy, safety, method of administration, and benefits
- The appropriate actions to take and persons to contact in an emergency involving blood or OPIM
- The procedures to follow if an exposure incident occurs, including the method of reporting and medical follow-up
- The evaluation and follow-up required after an exposure incident
- The signs, labels, and color coding systems used to identify potentially infectious materials

Additional training will be provided to faculty and staff when there are any changes of tasks or procedures affecting the faculty and staff's occupational exposure. Faculty or staff who have received training on bloodborne pathogens in the 12 months preceding the effective date of this plan will only receive training in provisions of the plan that were not covered.

XVII. RECORD KEEPING FOR FACULTY, STAFF, AND STUDENTS

The Environmental Health and Safety Office (EHS) is responsible for maintaining training records for faculty and staff, which will be kept at the EHS Office. Training records will be maintained for three years from the date of training. The following information will be documented:

- The dates of the training sessions
- An outline describing the material presented
- The names and qualifications of persons conducting the training
- The names, social security numbers, and job titles of all persons attending the training sessions

The Student and Employee Health Clinic is responsible for maintaining medical records for all individuals (faculty, staff, or students) who have utilized their services as indicated below. Medical

records must be maintained in accordance with OSHA Standard 29 CFR 1910. 20. These records shall be kept confidential and must be maintained for at least the duration of employment, studies, or volunteer effort plus 30 years.

The records must include the following:

- The name and social security number of the individual.
- A copy of individual's HBV vaccination status, including the dates of vaccination.
- A copy of all results of examinations, medical testing, and follow-up procedures.
- A copy of the information provided to the health care professional, including a description of the individual's duties as they relate to the exposure incident and documentation of the routes of exposure and circumstances of the exposure.

Availability: Medical records must be made available to an employee in accordance with 29 CFR 1910. Medical records must be available to the Assistant Secretary of Labor for the Occupational Safety and Health and Administration and the Director of the National Institute for Occupational Safety and Health upon request.

Transfer of Records: If this facility is closed or there is no successor employer to receive and retain the medical records for the prescribed period the Director of the NIOSH will be contacted for final disposition.

Evaluation and Review: This program and its effectiveness are reviewed every year and updated as needed.

Part Three

Chemical Hygiene Plan

(Note: "Prudent Practices for Handling Hazardous Chemicals in Laboratories" (National Research Council, 1981) was used as the basis for these guidelines)

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1.0 GENERAL SAFETY PRINCIPLES

The following guidelines have been established to minimize hazards and to maintain basic safety in the laboratory:

- Examine the known hazards associated with the materials being used. Never assume all hazards have been identified. Carefully read the label before using an unfamiliar chemical. When appropriate, review the Material Safety Data Sheet (see MSDS form in Appendix C) for special handling information. Determine the potential hazards and use appropriate safety precautions before beginning any new operation. If you are a student and have any questions regarding the safe handling of the chemical, contact the faculty member responsible for your course. If you are a graduate student or researcher, contact your PI, the technical staff or EHS.
- Be familiar with the location of emergency equipment, fire alarms, fire extinguishers, emergency eyewash and shower stations and know the appropriate emergency response procedures.
- Avoid distracting or startling other students or workers when they are handling hazardous chemicals.
- Use equipment and hazardous chemicals only for their intended purposes.
- Always be alert for unsafe conditions and actions and call attention to them so that corrective action can be taken as quickly as possible.
- Wear eye and face protections and impervious aprons when appropriate.
- Always inspect equipment for leaks, tears and other damage before handling a hazardous chemical. This includes fume hoods, gloves, goggles, etc.
- Avoid tasting or smelling hazardous chemicals.
- Ensure all chemical containers are properly labeled.

1.1. HEALTH AND HYGIENE

The following practices have been established to protect faculty, staff and students from health risks associated with the use of hazardous chemicals:

- Avoid direct contact with any hazardous chemical. Know the types of protective equipment available and use the proper type for each job.
- Confine long hair and loose clothing and always wear footwear that fully cover the feet.
- Do not pipette by mouth.

- Use appropriate safety equipment whenever exposure to gases, vapors or aerosols is suspected and ensure exhaust facilities are working properly.
- Wash hands thoroughly with soap and water after handling chemicals, before leaving the laboratory and before eating or drinking.
- Replace personal protective equipment as appropriate.
- Faculty, staff, and students should be familiar with the symptoms of exposure for the chemicals with which they work and the precautions necessary to prevent exposure.

1.2. FOOD AND DRINK IN THE LABORATORY

The following statements are the accepted practice regarding food and drink in laboratories and should be followed at all times:

There will be no food, drink, smoking or applying cosmetics in laboratories, which have radioactive materials, biohazard materials or hazardous chemicals present. There will be no storage, use or disposal of these items in laboratories (including refrigerators within laboratories). Rooms that are adjacent, but separated by floor to ceiling walls, and do not have any chemical, radioactive or biohazard agents present, may be used for food consumption, preparation, or application of cosmetics at the discretion of the individual responsible for the area(s).

The Department of Medical & Research Technology considers the third and fourth floor lobbies, the third floor lecture room during events (319) as well as the student resource room (411) acceptable areas for student food and drink consumption.

1.3. HOUSEKEEPING

Safety follows from good housekeeping practices. Use the following guidelines to maintain an orderly laboratory:

- Keep work areas clean and uncluttered. Clean up work areas upon completion of an operation or at the end of each workday, including floors.
- Dispose of wastes per University Waste Disposal procedures.
- Clean spills immediately and thoroughly, as per the guidelines established in section 2.0 of this document.
- Do not block exits, emergency equipment or controls or use corridors and stairways as storage areas.
- Ensure that hazardous chemicals are properly segregated into compatible categories.

1.4 CHEMICAL HANDLING AND STORAGE

The decision to use a hazardous chemical should be a commitment to handle and use the chemical properly from initial receipt to disposal.

- Information on proper handling, storage and disposal of hazardous chemicals and access to related MSDS documents need to be made available to all faculty, staff or students prior to the use of the chemicals.
- Always purchase the minimum amount necessary to maintain operations.
- Chemical containers with missing or defaced labels or that violate appropriate packaging regulations should not be accepted.
- Chemicals utilized in the laboratory must be appropriate for the laboratory's ventilation system.
- Chemicals should not be stored on high shelves and large bottles should be stored no more than two (2) feet from floor level.
- Chemicals must be segregated by compatibility.
- Chemical storage areas need to be labeled as to their contents.
- Storage of chemicals on the laboratory bench or in other work areas must be kept to a minimum.
- Chemicals should not be stored in the corridor.
- Any chemical mixture will be assumed to be as toxic as its most toxic component.
- Assume that substances of unknown toxicity will be toxic.

1.5 TRANSPORTING OF CHEMICALS

When transporting chemicals outside the laboratory, precautions should be taken to avoid dropping or spilling chemicals.

- Carry glass containers in specially designed bottle carriers or a leak resistant, unbreakable secondary container.
- When transporting chemicals on a cart, use a cart that is suitable for the load and one that has high edges to contain leaks or spills.
- When possible, transport chemicals in freight elevators to avoid the possibility of exposing people on passenger elevators.

1.6. COMPRESSED GASSES

Special systems are needed for handling materials under pressure. Cylinders pose mechanical, physical, and/or health hazards, depending on the compressed gas in the cylinder.

- Cylinders with regulators must be individually secured. Only cylinders with valve protection caps securely in place may be safely gang-chained (chained in-groups).
- When storing or moving a cylinder, have the valve protection cap securely in place to protect the valve.
- Cylinders must be secured in an upright position at all times. Use suitable racks, straps, chains, or stands to support cylinders against an immovable object, such as a bench or a wall, during use and storage. Do not allow cylinders to fall or lean against one another.
- Use an appropriate cart to move cylinders (presently located in room 301).
- Never bleed a cylinder completely empty. Leave a slight pressure to keep contaminants out.
- Oil or grease on the high-pressure side of an oxygen cylinder can cause an explosion. Do not lubricate an oxygen regulator or use a fuel gas regulator on an oxygen cylinder. Use an oxygen approved regulator. All wrenches used on oxygen cylinders should be made of non-ferrous material.
- Always wear goggles or safety glasses with side shields when handling compressed gases.
- Always use appropriate gauges, fittings, and materials compatible with the particular gas being handled.
- When planning on working with a toxic, corrosive, or reactive gas, EHS should be contacted for information concerning specific handling requirements. Generally, these gases will need to be used and stored with local exhaust ventilation such as a lab hood or a gas cabinet designed for that purpose.

1.7. UNATTENDED OPERATIONS

At times, it may be necessary to leave a laboratory operation unattended. Follow these basic guidelines in the design of an experiment to be left unattended:

If you are a student in a student laboratory, always check with the faculty responsible for the course to determine if it is necessary to leave a laboratory operation unattended. If you are a researcher or a graduate student, develop a protocol with your PI for the unattended operation of potentially dangerous equipment or methods. Faculty or PI's should develop a protocol for potential interruptions in electric, water, inert gas and other services and provide containment for toxic substances as part of the protocol.

A warning notice must be posted in the vicinity of the experiment if hazardous conditions are present.

1.8. WORKING ALONE

Students are not allowed to work unsupervised by faculty or staff in teaching laboratories. The primary responsibility for the supervision of the teaching laboratories belongs to the faculty.

All faculty and researchers should avoid working alone whenever possible.

1.9. STORAGE AND DISPOSAL OF HAZARDOUS WASTE

For guidelines on the storage and disposal of hazardous wastes from laboratory operations refer to the University Waste Disposal Policies and Guidelines [WEB LINK](#). Any questions concerning disposal of hazardous waste should be directed to Waste Management at 410-706-6281 (see Hazardous/chemical waste removal form in Appendix C)

2.0 STANDARD LABORATORY SAFE HANDLING / STORAGE REQUIREMENTS

2.1 HAZARD IDENTIFICATION

Identifying the specific hazard associated with a chemical greatly reduces chances of misuse by laboratory employees, new users, or visitors to the laboratory. At the very minimum, chemical containers should have labels that identify their contents and the hazards associated with the use of the chemical. With respect to identifying containers, storage areas and laboratory entranceways, the following conditions entail hazard identification:

- PIs, faculty members, and technical staff must ensure that labels on incoming containers of hazardous chemicals are not removed or defaced. Labels contain information on the identity of the chemical(s) in the container and the hazard identification of the chemical(s).
- It is recommended that incoming containers be labeled with the PI's or faculty member's name and date of receipt.
- PIs, faculty members, and technical staff must ensure that DMRT employees have access to appropriate MSDS documents.
- Chemicals must be stored according to compatibility. (see EHS web site for compatibility guide). Particularly hazardous chemicals should be stored and handled with extreme care. When ordering chemicals that are unfamiliar, review the MSDS before purchase so that use and storage guidelines are understood. Additionally, storage areas for biohazard agents and radioisotopes should be appropriately labeled. Contact the DMRT technical staff for more information.
- Laboratories that use hazardous materials need to have signs visibly posted with emergency contact numbers (two names, preferably the PI, faculty member or technical staff) on the external doorway to the lab. These names and numbers shall be updated when personnel change. Contact EHS with changes. In case of an emergency, responders need this information to contact knowledgeable personnel about specific laboratory hazards. The sign

also needs to include information on the hazards in the laboratory and proper precautions to take when entering the laboratory. Laboratory door signs can be obtained by calling the DMRT technical staff.

- All peroxide forming chemicals need to be labeled with the date the container was received and the date it was opened. After the recommended disposal date, the chemicals should be tested for peroxides or disposed of properly.

2.2 HAZARDS SUBJECT TO REVIEW OR PRIOR APPROVAL

The Laboratory Standard requires that PI's or faculty members identify those activities that the PI or faculty member believes to be of a sufficiently hazardous nature to warrant prior approval before implementation by an employee or student.

2.3 CHEMICALS DEVELOPED IN THE LABORATORY

The following requirements apply to chemical substances developed in the laboratory:

- If the composition of the chemical substance that is produced exclusively for the laboratory's use is known, the PI or faculty member must determine if it is a hazardous chemical. This can be done by a literature search for similar substances. If the chemical is determined to be hazardous, the PI or faculty member must provide appropriate training to protect employees and students.
- If the chemical produced is a product or a by-product whose composition is not known, the PI or faculty member must assume that the substance is hazardous and must comply with the requirements of the CHP.
- If the chemical is produced for sale or use outside of the laboratory, the PI or faculty member must prepare an appropriate MSDS document in accordance with the OSHA Hazard Communication Standard.

2.4 PROVISIONS FOR PARTICULARLY HAZARDOUS SUBSTANCES

Permissible Exposure Limits (PEL). The Laboratory Standard requires that PI's, faculty members or supervisory technical staff ensure that employees' or students working with hazardous substances do not exceed the PELs. The PELs represent Time Weighted Averages (TWAs) in parts per million (ppm) or milligrams of substance per cubic meter of air (mg/m³). The TWA represents the ratio between exposure and work shift.

The American Conference of Governmental Industrial Hygienists (ACGIH) has established Threshold Limit Values (TLVs), which are TWA values similar to PELs. The TLVs are in some cases lower than the PELs. To keep employee or student exposures as low as reasonably achievable, PI's, faculty members or supervisory technical staff will be expected to uphold the lowest exposure limit, be it a PEL or a TLV.

Exposure limits can be found on the chemical's MSDS document or by contacting EHS.

Employee Exposure Determination. PI's, faculty members, or supervisory technical staff must contact EHS to perform employee exposure monitoring under the following circumstances:

A. Initial monitoring must be performed if there is reason to believe employee or student exposure levels routinely exceed $\frac{1}{2}$ the PEL.

B. Periodic monitoring must be performed when initial monitoring reveals an exposure over $\frac{1}{2}$ the PEL.

Monitoring can be terminated in accordance with the relevant standard. EHS will notify each employee or student of the monitoring results within 15 working days after receipt of monitoring results. The results must be either individually distributed in writing or posted in a location accessible to all affected employees or students.

Special Considerations. The OSHA Laboratory Standard requires that special precautions for additional employee protection be followed for the laboratory use of select carcinogens, reproductive toxicants and chemicals with a high degree of acute toxicity.

Protection from these hazards is provided by ensuring exposure to such hazards is minimized, i.e., kept under the PEL, TLV, or Short Term Exposure Limit (STEL), or eliminated. To minimize exposure, it is necessary to determine the route by which exposure may occur, whether by inhalation, absorption, injection, ingestion or a combination of exposure routes. To ensure employees do not receive exposures in excess of the PEL or TLV, hygienic standards have been established for many toxic materials. The following general hygiene standards should be observed when using select carcinogens, reproductive toxicants and chemicals with a high degree of acute toxicity.

Establish a designated area.

- Use and store materials only in designated areas: a restricted access hood, glove box, or portion of a lab, designated for use of highly toxic substances. Assure that all faculty, staff, or students with access are aware of necessary safety precautions.
- Label all containers, storage and use areas appropriately.

Use proper containment devices for the protocol and chemical(s) being used.

- Use a hood or other containment device for procedures that may result in the generation of aerosols or vapors; trap released vapors to prevent their discharge with fume hood exhaust.
- It is recommended that breakable containers be stored in chemical-resistant trays. Work and mount any apparatus above such trays or cover work and storage surfaces with removable, absorbent, plastic backed paper.

Removal of Contaminated Waste

Contact the DMRT technical staff and follow the guidelines established in the University Hazardous Waste Disposal policies.

Follow decontamination procedures prior to leaving the designated area.

- On leaving the designated area, remove protective apparel (place it in an appropriate, labeled container) and thoroughly wash hands, forearms, face, and neck.
- Thoroughly decontaminate or dispose of contaminated clothing or shoes. If possible, chemically decontaminate by chemical conversion to a less toxic product.
- Decontaminate vacuum pumps or other contaminated equipment, including glassware, before removing them from the designated area. Decontaminate the designated area before normal work is resumed.
- Use a wet mop or a vacuum cleaner equipped with a HEPA filter to decontaminate surfaces. **DO NOT DRY SWEEP SPILLED POWDERS.**
- Protect vacuum pumps against contamination with traps and/or appropriate filters and vent effluent into the hood.

Always take extra precautions when working with particularly hazardous chemicals.

- Consult the MSDS for toxic properties and follow the specific precautions and procedures.
- Guard against spills and splashes. Appropriate safety apparel, especially gloves, should be worn. All hoods, glove boxes, or other essential engineering controls should be operating properly before work is started.
- Notify the PI, faculty member or technical staff of all incidents of exposure or spills.

2.5 PHYSICAL HAZARDS

Materials that present a physical hazard can be safely used if the specific hazard(s) are understood. If appropriate precautions are not taken, personal injury or property damage may occur. Additionally, certain chemicals cannot be safely mixed or stored with other chemicals because of the danger of a severe or extremely toxic reaction.

Hazardous chemicals require that special procedures for handling and storage are followed. The PI, faculty member or technical staff should create specific SOPs working with the material.

Flammable/Combustible Material. The National Fire Protection Agency (NFPA) places flammable and combustible liquids in the following classes:

Flash Point

Boiling Point

Flammable

| | | |
|----------|-------------------|--------------------|
| Class IA | < 73 °F (22.8 °C) | < 100 °F (37.8 °C) |
| Class IB | < 73 °F (22.8 °C) | 100 °F (37.8 °C) |
| Class IC | 73 °F (22.8 °C) | |

Combustible

| | | |
|------------|------------------|------------------|
| Class II | 100 °F (37.8 °C) | < 140 °F (60 °C) |
| Class IIA | 140 °F (60 °C) | < 200 °F (93 °C) |
| Class IIIB | 200 °F (93 °C) | |

Note: The flash point is defined as the minimum temperature at which a liquid gives off vapor in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. For handling flammable/combustible materials, observe the following guidelines:

- Eliminate ignition sources such as open flames, hot surfaces, sparks from welding or cutting, operation of electrical equipment, and static electricity.
- Store in NFPA approved flammable liquid containers or storage cabinets, in an area isolated from ignition sources or in a special storage room designed for flammable materials.
- Ensure there is proper bonding and grounding when it is required, such as when transferring or dispensing a flammable liquid from a large container or drum. Ensure bonding and grounding is checked periodically.
- Ensure that appropriate fire extinguishers and/or sprinkler systems are in the area.

Corrosives. Materials which can react with the skin, causing burns similar to thermal burns, and/or which can react with metal, causing a deterioration of the metal's surface.

- Containers and equipment used for storage and processing of corrosive materials need to be corrosion resistant.
- Eye protection and appropriate gloves must be used when handling corrosive materials. A faceshield, rubber apron, and/or rubber boots may also be appropriate.
- **Never add water to acid.** When mixing concentrated acids with water, add the acid slowly to water.
- An eyewash and safety shower must be readily accessible to areas where corrosives are used and stored. In the event of skin or eye contact with corrosives, immediately flush the area of contact with cool water for 15 minutes. Remove all affected clothing. Obtain medical help.
- See the "Personal Protective and Safety Equipment" section of this document for eyewash and safety shower specifications.

Oxidizers. Materials that react with other substances by giving off electrons and undergoing reduction. This reaction may result in fire or explosion. The intensity of the reaction depends on the oxidizing-reducing potential of the materials involved. The following steps need to be followed.

- Know the reactivity of the materials involved in the experiment or process. Ensure there are no extraneous materials in the area that could become involved in a reaction.
- If the reaction is anticipated to be violent or explosive, use shields or other methods for isolating the materials or the process.

Water Reactive Materials. Materials that react with water to produce a flammable or toxic gas or other hazardous condition. Often a fire or explosion results. Safe handling of water reactive materials will depend on the specific material and the conditions of use and storage. Examples of water reactive chemicals include alkali metals such as lithium, sodium, and potassium; acid anhydrides, and acid chlorides.

Pyrophoric Materials. Materials that ignite spontaneously upon contact with air. Often the flame is invisible. Examples of pyrophoric materials are silane, silicon tetrachloride, and white or yellow phosphorous. Pyrophoric chemicals need to be used and stored in inert environments.

Peroxidizable Chemicals (Organic Peroxides). Materials that undergo auto-oxidation (a reaction with oxygen in the air) to form peroxides (an O₂ group), which can explode with impact, heat, or friction. Since these chemicals may be packaged in an air atmosphere, peroxides can form even though the container has not been opened, necessitating careful handling. The following steps need to be taken.

- Date all peroxidizables upon receipt and upon opening. After the recommended disposal date, test the chemical for peroxides or dispose of them properly.
- Do not open any container that has an obvious solid formation around the lid.
- The addition of an appropriate inhibitor to quench the formation of peroxides is recommended.
- It is recommended to chemically test for peroxides periodically.
- Follow the same basic handling procedures as for flammable materials.
- Contact the DMRT technical staff who will contact the Waste Management office to remove any peroxidizables that are undated or have not been used for extended periods.

Light-Sensitive Materials. Materials that degrade in the presence of light, forming new compounds that can be hazardous, or resulting in conditions such as pressure build-up inside a container that may be hazardous. Examples of light sensitive materials include chloroform, tetrahydrofuran, ketones and anhydrides.

- Store light-sensitive materials in a cool, dark place in amber colored bottles or other containers that reduce or eliminate penetration of light.

Unstable Materials. Compounds that can spontaneously release large amounts of energy under normal conditions, or when struck, vibrated, or otherwise agitated. Some chemicals become increasingly shock-sensitive with age. Of great concern in the laboratory is the inadvertent formation of explosive or shock-sensitive materials such as peroxides, perchlorates (from perchloric acid), picric acid and azides.

- Contact the DMRT technical staff when it is suspected that the inadvertent formation of shock-sensitive materials in ductwork, piping, or chemicals being stored has occurred.
- Date all containers of explosive or shock-sensitive materials upon receipt and when opened.
- If there is a chance of explosion, use barriers or other methods for isolating the materials or the process.

Cryogenics. Cryogenic liquids such as oxygen, nitrogen, argon, helium, and hydrogen are substances that are normally in the gaseous state but are cooled to extremely low temperatures so that they are liquids. Some of the hazards associated with cryogenics are fire, pressure, weakening of materials, and skin or eye burns upon contact with the liquid. The following precautions should be taken when working with cryogenics.

- Equipment must be kept clean, especially when working with liquid or gaseous oxygen.
- Mixtures of gases or fluids need to be strictly controlled to prevent formation of flammable or explosive mixtures.
- Always wear safety glasses with side shields or goggles when handling cryogenics. If there is a chance of a splash or spray, a full-face protection shield, an impervious apron or coat, cuffless trousers, and high-topped shoes should be worn. Watches, rings, and other jewelry must not be worn. Gloves should be impervious and sufficiently large to be readily thrown off should a cryogen spill occur. Potholders could also be used.
- Cryogenic containers and systems should have pressure relief mechanisms.
- Cryogenic containers should be made from materials such as austenitic stainless steels, copper, and certain aluminum alloys that are capable of withstanding extremely low temperatures.
- Since glass ampoules can explode when removed from cryogenic storage if not sealed properly, storage of radioactive, toxic or infectious agents should be placed in plastic cryogenic storage ampoules.

2.6 RADIOACTIVE MATERIAL HAZARDS

Use of radioactive materials at DMRT is strictly controlled. Contact the Radiation Safety office 410-706-6281 if you plan to use radioactive materials. See the EHS web site for more information on the use of radioactive material at the University of Maryland Baltimore.

2.7 BIOLOGICAL MATERIAL HAZARDS

Please refer to DMRT's policies on the use of Biological Materials in the laboratories found in Part 2 of this manual. Additional information can be found at the EHS web site or by contacting EHS.

3.0 EMERGENCY / MEDICAL PROCEDURES

3.1 BASIC STEPS FOR EMERGENCY AND SPILL RESPONSE

Releases of hazardous substances that pose a significant threat to health and safety or that, by their very nature, require an emergency response regardless of the circumstances surrounding the release or the mitigating factors are emergency situations. The following definitions designate an emergency situation:

- The situation is unclear to the person causing or discovering the spill.
- The release requires evacuation of persons.
- The release involves or poses a threat of fire, suspected fire, explosion or other imminent danger; conditions that are Immediately Dangerous to Life and Health (IDLH); or high levels of exposure to toxic substances.
- The person(s) in the work area is uncertain they can handle the severity of the hazard with the personal protective equipment (PPE) and response equipment that has been provided and/or the exposure limit could easily be exceeded.

Conversely, releases that do not pose significant safety or health hazards to person(s) in the immediate vicinity or to the person(s) cleaning up the material and do not have the potential to become emergencies within a short time frame are not emergency situations. The following situations **ARE NOT** emergencies:

- The person causing or discovering the release understands the properties and can make an informed decision as to the exposure level.
- DMRT faculty or technical staff can appropriately clean the release.
- The materials are limited in quantity, exposure potential, or toxicity and present minor safety or health hazards to persons in the immediate work area or those assigned to clean up the activity.

- Incidental releases of hazardous substances that are routinely cleaned up by EHS need not be considered an emergency.

Emergency Situation - Fire. The following steps are basic protocol for handling a fire or fire-related emergency situation in the laboratory (also refer to Part 1 of this manual):

1. Pull the fire alarm
2. Notify University Police at 711
3. Evacuate the building by using the stairwells, not the elevators.
4. Inform the building Emergency Wardens or the building evacuation supervisor of the nature and location of the fire

Emergency - Spill. If the spill is of high toxicity or flammability or you are unsure of how to proceed or is more than one liter, execute the following:

1. Notify University Police at 711
2. Evacuate personnel from the spill area and alert neighbors to the spill
3. Isolate the spill area and close doors to the room where the spill occurred
4. Shut down equipment if possible
5. Provide information on the nature and location of spill to emergency response personnel

Evacuation of the building may be necessary if chemicals or contaminants could enter the air handling system of a building.

Attend to victims for a body splash:

6. Remove person(s) from spill area to fresh air only if attempts to rescue the victim(s) does not present a danger to the rescuers.
7. Remove contaminated clothing while under an emergency shower.
8. Flood affected area with water for at least 15 minutes or longer if pain persists.
9. Wash skin with mild soap and water - do not use neutralizing chemicals, unguents, creams, lotions or salves.
10. Contact emergency response personnel and ensure they know the chemical(s) involved. Have MSDS(s) available if possible.

Attend to victims for an eye splash:

1. Remove victim(s) from spill area to fresh air only if attempts to rescue victim(s) does not present a danger to the rescuers.
2. Lead the victim(s) immediately to an emergency eye wash facility.
3. Hold eyelids open.
4. Flush eyes for at least 15 minutes or longer if pain persists.
5. Contact emergency response personnel and assure they know the chemical(s) involved. Have MSDS(s) available if possible.

Mercury Spills. Each laboratory should have or have access to a mercury spill clean up kit. In the event of a spill (broken thermometer) isolate the area in which the material was spilled and prevent people from stepping on the mercury. Follow the directions provided by the mercury spill clean-up kit and contact the Hazardous Waste Management division at 410-706-6281 to pick up mercury waste when you are done. For spills larger than the laboratory can handle, contact EHS for spill cleanup, instructions or assistance.

Non-Emergency Situation - Spill. If the spill is less than one liter and the chemical involved is of low toxicity and a low flammable hazard, handle it in the following manner:

If there are questions about proper spill response techniques, call EHS at 410.706.7055. After hours dial 711.

1. Utilize absorbent materials (i.e., paper towels).
2. Choose the proper protective equipment:
 - Always wear gloves and protective eye wear
 - Use additional protective equipment such as an apron, coveralls, or boots if necessary.
3. Confine or contain the spill.

For non-reactive spills:

1. Cover liquid spills with absorbent and scoop into a plastic disposal bag.
2. Sweep solid materials into a dustpan and place in a sealed container.
3. Contact the DMRT technical staff or the Hazardous Waste Management division for proper disposal instructions.

For reactive or potentially reactive spills:

1. Cover liquid spills with absorbent and scoop into an appropriate disposal container.
2. Wet mop dry substances to avoid spreading hazardous dust, provided it is non-water reactive.
3. If spilled chemical is a volatile solvent, transfer disposal bag to a hood for containment.
4. Follow the University Hazardous Waste Disposal Procedures for disposal.

Power Outages. If emergency lighting and fire alarms ARE NOT operable, evacuate the building after the following steps have been taken:

- Place lids on all open containers of volatile chemicals
- Lower the sash on chemical fume hoods
- Shut down all equipment (leave cooling water and purge gases on as necessary)
- Turn off all ignition sources
- Secure or isolate reactions that are underway (boiling liquid on a hot plate, distillations)
- Take your books, coats, purse/wallet, keys, etc.
- Close the fire doors

In anticipation of possible power outages, do the following:

- Have a flashlight conveniently located or other emergency lighting
- Make sure that all emergency contact numbers on the door are accurate and updated
- Shut down experiments

3.2 INJURY AND ILLNESS

The "Employee's First Report of Injury" (Appendix D) form must be completed on all work related employee injuries. The completed form must accompany the injured worker to the Student and employee Health Center (SEH). The employee's supervisor should page the SEH at 410-512-0021 and advise the SEH that there is an injured UMB employee. Describe the nature of the injury or illness. If there is no response within 10 minutes, beep Ms. Harriet Mandell at 410-416-6894. If Ms. Mandell is not available, call the clinic director, Dr. Kevin Ferentz, at 410-328-2686 or page him at 410-232-2668. The "Supervisor's Report of Injury" and the "Accident Witness Statement" should be completed and faxed immediately to Risk Management (410-706-1520) whenever possible.

All serious injuries should be reported immediately to Occupational Safety and Health (410.706.3490).

Failure to follow the above procedure may result in the delay of payment for medical expenses and/or jeopardize the proper leave status for your work injury.

For student injury and illness refer to Part 2 of this manual.

3.3 MEDICAL CONSULTATIONS AND EXAMINATIONS

Health assessments prior to work assignment for new employees may be required under certain circumstances.

DMRT must provide employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, under the following circumstances:

- When an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory, the employee must be provided an opportunity to receive an appropriate examination.
- Where exposure monitoring reveals an exposure level routinely above the action level (or in the absence of an action level, the Permissible Exposure Limit) for an OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, medical surveillance will be established for the affected employee as prescribed by the particular standard.
- Whenever an event takes place in the work area, such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee must be provided an opportunity for a medical consultation. Such consultations will be for the purpose of determining the need for a medical examination.
- All medical consultations and examinations must be performed by or under the direct supervision of a licensed physician and must be provided without cost to the employee, without loss of pay and at a reasonable time and place.

The faculty member or the PI must provide the following information to the physician:

- The identity of the hazardous chemical(s) to which the employee may have been exposed.
- A description of the conditions surrounding the exposure, including available quantitative exposure data.
- A description of the signs and symptoms of exposure that the employee is experiencing, if any.
- A copy of the MSDS(s).

The Department will obtain a written opinion from the examining physician which must include the following:

- Any recommendation for further medical follow-up.
- The results of the medical examination and any associated tests.
- Any medical condition that may be revealed in the course of the examination that may place the employee at increased risk because of exposure to a hazardous chemical found in the workplace.
- A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.
- The written opinion of the physician must not reveal specific finding of diagnoses unrelated to occupational exposure.

4.0 STANDARD LABORATORY FACILITY REQUIREMENTS

4.1 SIGNS AND INFORMATION

Labels and warning signs need to alert faculty, staff, and students to potentially hazardous materials and allow those unfamiliar with the laboratory surroundings to identify hazardous chemical use and storage areas, safety facilities, emergency equipment and exits, and assist emergency response personnel. Signs and labels are generally available from the DMRT technical staff or EHS.

Material Safety Data Sheets (MSDSs). A MSDS is a document containing chemical hazard identification and safe handling information and is prepared in accordance with the OSHA Hazard Communication Standard.

Chemical manufacturers and distributors must provide the purchasers of hazardous chemicals an appropriate MSDS for each hazardous chemical/product purchased.

The Hazard Communication Standard requires that Departments and/or PIs keep MSDSs and that the MSDSs are readily accessible to laboratory employees. The system a laboratory uses to store MSDSs can vary from keeping them in a notebook or file cabinet to using the EHS information system. The system adopted must provide easy access to MSDSs for hazardous chemicals used in the lab.

The office of EHS is a central repository for MSDSs. If you wish to review an MSDS(s) or receive a copy of an MSDS(s), contact your PI, technical staff supervisor, faculty member or EHS at 410-706-7055 during normal working hours.

Restricted Access and Designated Areas. Facilities containing certain hazards need to have warning signs posted at the designated area of the laboratory where the hazard exists, and at the entranceway to

the laboratory. Any areas placarded as such are restricted access, designated areas and have certain standards regarding training and use by faculty, staff, and students. Such hazards may include:

- Known carcinogens
- Lasers
- Strong magnetic fields
- HIV and HBV research laboratories and production facilities*
- Biological agents that require Biosafety Level 2 or higher*
- Radioactive materials or sealed radioactive sources*
- Other chemical hazards will be dealt with on a case-by-case basis, with consultation from EHS.

*Please contact EHS for requirements on these items.

4.2 CONTROL MEASURES

The PI, faculty member, or supervisory technical staff must implement control measures to reduce faculty, staff, or student exposure to hazardous chemicals. The three types of control measures are:

- **Administrative Controls:** methods of controlling faculty, staff or student exposures to contaminants by job rotation, work assignment or time periods away from the contaminant. Examples include Standard Operating Procedures, Chemical Hygiene Plans and Safety Manuals.
- **Engineering Controls:** methods of controlling faculty, staff, or student exposures by modifying the source or reducing the quantity of contaminants released into the work environment. Examples include fume hoods and biosafety cabinets.
- **Personal Protective Equipment:** personal safety equipment designed for faculty, staff or student protection from hazardous chemicals. Examples include gloves and lab coats.

Note: OSHA law regarding air contaminants states that engineering controls and administrative controls must first be determined and implemented when feasible. When such controls are not feasible to achieve full compliance, protective equipment or any other protective measures must be used to keep the exposure of faculty, staff or students to air contaminants within the limits prescribed in the rule.

OSHA requires control measures when the following circumstances are met:

- Whenever faculty or staff use hazardous chemicals.
- Whenever faculty or staff exposures exceed $\frac{1}{2}$ the PEL and/or the TLV.

- Upon addition of new chemicals or changes in procedures.
- Other situations should be dealt with on a case-by-case basis. Consult the DMRT technical staff or EHS for assistance in establishing control measures.

The following general control measures are recommended for use in most situations requiring the use of hazardous chemicals:

Use the following primary methods for detecting exposures:

- Determine the source of exposure.
- Determine the path the contaminant follows to reach the faculty, staff or student.
- Determine the faculty, staff or student's work pattern and use of personal protective equipment.
- Change one or more of the above pathways to reduce or eliminate exposure.
- Substitute less harmful chemicals for more harmful chemicals whenever possible.
- Change or alter processes to minimize exposure.
- Isolate or enclose a process or work operation to reduce the number of faculty, staff or students exposed (for example, use a fume hood).
- Use wet methods to reduce the generation of dust.
- Use local exhaust ventilation (hoods) at point of generation or dispersion of contaminants and use dilution (general) ventilation to reduce air contaminants.
- Practice good housekeeping procedures to reduce unnecessary exposures.
- Use training and education as primary administrative controls for reducing exposures.
- Use special control methods such as shielding and continuous monitoring devices to control exposures in special situations.

4.3 PERSONAL PROTECTIVE EQUIPMENT

The DMRT policy on the use and selection of Personal Protective Equipment (PPE) must be followed. However the following is some basic information on PPE commonly found in laboratories. PPE must be provided to faculty, staff and students under the appropriate circumstances. Faculty, staff and students need to be trained on the proper use of any PPE issued to them and faculty, staff and students have the responsibility of properly using such equipment.

The MSDS may be consulted for information on PPE and safety procedures recommended for a given chemical, though the MSDS may not provide sufficient information concerning the specific type of safety equipment required (for example, it may say "use gloves" but not list the best glove to use). The PI, faculty member or technical staff should be contacted if more information is needed. The EHS web page also contains additional information on the use and selection of personal protective equipment.

OSHA has adopted the American National Standards Institute (ANSI) consensus standards for eye protection and emergency shower and eyewash facilities.

Eye Protection. Eye protection must be made available to all faculty, staff and students or visitors to laboratories where chemicals are used and stored. Protective eye and face equipment must be used where there is a reasonable probability of injury from hazardous chemicals that can be prevented from such equipment. The minimum acceptable requirements are for hardened glass or plastic safety spectacles.

The PI, or faculty member should establish the level of eye protection needed per laboratory activity. Specialized types of eye protection, such as ultraviolet light restricting safety glasses, are available. The following types of eye protection are recommended for use in the laboratory by ANSI:

All eye protective devices must be stamped with "Z87" by the manufacturer if they meet ANSI standards. If the eye protection is not marked, it may not be the most effective protection available.

- Safety glasses with side shields offer minimal protection against flying fragments, chips, particles, sand and dirt. When a splash hazard exists, other protective eye equipment must be worn.
- Safety goggles (impact goggles) offer adequate protection against flying particles. These must be worn when working with glassware under reduced or elevated pressure or other similar conditions.
- Chemical splash goggles (acid goggles) have indirect venting for splash proof sides, which provide adequate protection against splashes. Chemical splash goggles offer the best eye protection from chemical splashes. Impact goggles should not be worn when danger of a splash exists.
- Faceshields protect the face and neck from flying particles and splashes. Always wear additional eye protection under faceshields. Ultraviolet lightface shields should be worn when working around UV light sources.

Protection of Skin and Body. Skin and body protection involves the use of protective clothing to protect individuals from chemical exposure. Determine clothing needed for the chemical being used, as protective garments are not equally effective for every hazardous chemical. Some chemicals will permeate a garment in a very short time, whereas others will not. The basic and most effective forms of protection are gloves and lab coats.

Protect exposed skin surfaces when there is a reasonable anticipation of a splash. Open-toed shoes, sandals, shorts, etc. are not permitted when working in DMRT laboratories.

Even when there is minimal danger of skin contact with an extremely hazardous substance, lab coats, coveralls, aprons, or protective suits should be utilized. These garments should not leave the work site.

Exposures to strong acids and acid gases, organic chemicals and strong oxidizing agents, carcinogens, and mutagens require the use of specialized protective equipment that prevents skin contamination. Impervious protective equipment must be utilized. Examples include: appropriate gloves, aprons, boots and protective suits.

Respirators. The use of respirators in laboratories is strongly discouraged. The use of respirators is only allowed where engineering controls are not feasible or where they are being installed. Any individual that uses a respirator as part of his or her work at DMRT must be enrolled in the respirator program. Prior to using a respirator for the first time or for a new activity, employees must receive a medical exam from SEH, attend an EHS respiratory training session and be fit tested. Please contact the EHS at 410-706-3490 for a copy of the University Respiratory Protection Program. It can also be found on the EHS web page.

Laundry Contaminated with Potentially Infectious Material. All laundry that is contaminated with potentially infectious material should be bagged at the location where it was used and should not be sorted or rinsed in the location where it was originally used. Contaminated laundry should be placed and transported in bags or containers labeled with the Universal Biohazard symbol. Whenever contaminated laundry is wet and presents a reasonable likelihood of soak-through or leakage from the bag or container, the laundry should be placed and transported in bags or containers that prevent soak-through and/or leakage of fluids to the exterior. In addition, when DMRT technical staff ships contaminated laundry off-site for laundering they must ensure that the laundry is in bags or containers labeled with the Universal Biohazard symbol. The cost of offsite laundering is the responsibility of DMRT.

4.4 SAFETY EQUIPMENT

Safety Showers. Safety showers provide an immediate water drench of an affected person. The EHS recommends the following ANSI standards for location, design and maintenance of safety showers:

- Showers should be located within 25 feet of areas where chemicals with a pH of 2.0 or 12.5 are used.
- Showers should be located within 100 feet of areas where chemicals with a pH of > 2 and < 4 or >9 and < 12.5 are used.
- The location of the shower should be clearly marked, well lighted and free from obstacles, closed doorways or turns.
- Safety showers are checked and flushed annually by EHS.

Eye Wash Facilities. Eye wash facilities should be within 25 feet or 10 seconds travel of laboratories where injurious or corrosive chemicals are used or stored.

- Optimally, those affected must have both hands free to hold open the eye to ensure an effective wash behind the lids. This means providing eye wash facilities that are operated by a quick release system and simultaneously drench both eyes.
- Eye wash facilities must provide the minimum of a 15-minute water supply at no less than 0.4 gallons per minute.
- Eye wash facilities must not exceed 25 pounds per square inch (PSI).
- Eye wash facilities need to be flushed out for five minutes at a time, once per week.

Contact the DMRT technical staff or EHS regarding specific designs for eye wash facilities.

4.5 VENTILATION CONTROLS

Ventilation controls are those controls intended to minimize faculty, staff or student exposure to hazardous chemicals by removing air contaminants from the work site. There are two main types of ventilation controls:

- **General (Dilution) Exhaust:** a room or building-wide system, which brings in air from outside and ventilates within. Laboratory air must be continually replaced, preventing the increase of air concentration of toxic substances during the workday. General exhaust systems are not recommended for the use of most hazardous chemicals.
- **Local Exhaust:** a ventilated, enclosed workspace intended to capture, contain and exhaust harmful or dangerous fumes, vapors and particulate matter generated by procedures conducted with hazardous chemicals i.e., fumehood.

To determine ventilation requirements, assess the MSDS. Some MSDS terminology, as listed below, may indicate a need for special ventilation considerations beyond general exhaust ventilation:

- Use with adequate ventilation
- Avoid vapor inhalation
- Use in a fume hood
- Provide local exhaust ventilation

Proper Use of Local Ventilation Systems. Once a local ventilation system is installed in a work area it must be used properly to be effective. For use of hazardous chemicals warranting local ventilation controls, the following guidelines should be observed:

- Conduct all operations that may generate air contaminants at or above the appropriate PEL or TLV inside a fume hood.
- Keep all apparatus at least 6 inches back from the face of the hood and keep the slots in the hood baffle free of obstruction by apparatus or containers. Large equipment should be

elevated at least two inches off the base of the fume hood, to allow for the passage of air underneath the apparatus.

- Do not use the hood as a waste disposal mechanism.
- Minimize storage of chemicals or apparatus in the hood.
- Keep the hood sash closed at all times except when the hood is in use.
- Minimize foot traffic and other forms of potential air disturbances past the face of the hood.
- Do not have sources of ignition inside the hood when flammable liquids or gases are present.
- Use the sash as a safety shield when boiling liquids or conducting an experiment with reactive chemicals.
- Periodically check the air flow in the hood using a continuous monitoring device or another source of visible airflow indicator. If air flow has changed, contact the DMRT technical staff who will contact EHS for an inspection or Work Control at 410-706-7570 for repair.
- Never work with hazardous chemicals if the required ventilation system is not working.

EHS performs hood inspections annually. After an inspection, hoods are passed or failed for use based on the following criteria:

- The face velocity of air being drawn into the hood with sash open is measured quantitatively in feet per minute (fpm). One measurement is taken per square foot of face space and averaged.
- Hoods must have an average face velocity of 80-120 fpm, depending on their design, with 100 fpm being the ideal average face velocity with the sash full open.
- If the exhaust system does not pass the face velocity test, the PI or DMRT technical staff will be informed by the inspector. EHS will contact Work Control to have repairs initiated.
- If the exhaust system does pass, the inspector will post the date of inspection and will mark the hood to indicate proper sash position for optimum hood performance. The hood sash should be set at this point for procedures, which could generate toxic aerosols, gases or vapors. In general, the sash height should be set at a level where the operator is shielded somewhat from any explosions or violent reactions which could occur and where optimum air flow dynamics are achieved. If a fume hood has no markings regarding sash height or inspection dates, please contact the DMRT technical staff.

Certain types of local exhaust systems are not designed for the use of hazardous chemicals. If a local exhaust system's capabilities are not fully understood, check the manufacturers specifications, check with the DMRT technical staff or call EHS before using hazardous chemicals in the system. For further

information concerning ventilation guidelines and references go to the NIH Design Policy and Guidelines (Adobe .pdf format) for the mechanical engineering discipline.

5.0 STANDARD REPAIR / CLOSE-OUT DECOMMISSIONING PROCEDURES

5.1 DECONTAMINATION OF EQUIPMENT

Prior to repairing or moving equipment any chemical, biological or radioactive contaminants must be properly decontaminated. Follow decontamination procedures outlined in the following section.

5.2 INSTRUCTIONS FOR PREPARING A LABORATORY FOR RENOVATION WORK

To protect construction workers and University personnel from hazards associated with laboratory work, the following procedures must be followed when work is to be performed in an area where has contained hazardous chemicals, biological hazards and/or radioactive materials.

- **Chemical Hazard:** any surface that a hazardous chemical has come in contact with must be wiped down with a solution of warm soap and water. This applies only to areas that construction workers would be exposed to in the normal course of their work. For example, fumehoods (inside and out), laboratory bench tops, floors, refrigerators and sinks must be cleaned. Chemical containers must be moved and stored away from where renovation work is to be performed in the laboratory.
- **Biological Hazard:** Any surface that a biological hazard has come in contact with must be decontaminated. A solution of 1:10 household bleach (5.25% sodium hypochlorite) can be used to inactivate most infectious agents. The PI or technical staff are responsible for verifying that this has been performed and that sodium hypochlorite was the appropriate material to use to inactivate the agent. This applies only to areas that construction workers would be exposed to in the normal course of their work. For example, laboratory bench tops, floors, biological safety cabinets and clean benches, centrifuges, and refrigerators/freezers must be decontaminated. Biological safety cabinets are required to be decontaminated prior to being moved or serviced. The cabinet then must be re-certified when it is installed in its new location. Please contact the DMRT technical staff or EHS to determine how the cabinet needs to be decontaminated well in advance of the planned move.
- **Radiological Hazards:** A "certification for unrestricted use" must be on file or obtained from the Radiation Safety Office. Contact Radiation Safety at 410-706-6281 for additional information and instructions.

All clean-up procedures must be performed using appropriate personal protective equipment (PPE). To insure a speedy clearance procedure, please complete the EHS Laboratory Renovations Form that must be signed off by EHS and post it on the laboratory door. The form may be accessed at <http://www.ehs.umaryland.edu/osh/labrenov.htm>.

5.3 USE OF FORMALDEHYDE IN LABORATORY OPERATIONS

Any laboratory using formaldehyde in quantities that may exceed the Occupational Safety and Health Administration's (OSHA) Short Term Exposure Limit (STEL) of 2.0 ppm or Action Level of 0.5 ppm has the potential of being covered under OSHA's Formaldehyde Standard. The Formaldehyde Standard has the following requirements: Development of a sampling strategy for determining faculty, staff or student exposure to formaldehyde; periodic personal monitoring; providing and ensuring the use of appropriate personal protective equipment; medical surveillance; development of a written hazard communication program for formaldehyde; and providing information and training to faculty and staff on the hazards of working with formaldehyde.

If a laboratory is using formaldehyde and would like an exposure assessment to determine if they are covered under OSHA's Formaldehyde Standard they should contact the Occupational Safety Division at either 410.706.3490 or via the EHS Hazard Hotline.

Part Four

Shelter in Place Building Plan **for Allied Health Building**

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I. Introduction

Shelter in Place Building Plan for Allied Health Building (100 Penn Street)

Sheltering in Place is one of several response options available to emergency management directors and employees of the University of Maryland Baltimore (UMB) in the event of an emergency. Sheltering in place means persons will remain in a building until emergency management officials issue additional instructions or declare that the emergency condition has ended. It is a short-term option for limiting the potential exposure of persons to hazards that may be present in the outdoor environment.

In the event of an attack, disaster, local emergency situation, directive from city officials, or some other situation that calls for it, occupants of the Allied Health Building located at 100 Penn Street, Baltimore, MD 21201 will be instructed by the Shelter in Place Building Coordinator (Primary: Jeff Hawk, Back-Up: Karen Sack) on the best course of action to take. Instructions will be distributed within our building as follows:

- Emergency Management Team of the UMB Campus through pre-established means (use the automatic dialer to call Shelter in Place coordinators if all are involved. We have individual work and cell phone numbers for the coordinators if we are going to just activate a building or two. Can use the emergency alerts web page to post additional information. If the coordinator or their back up are not at the phone, we then notify the security guard of the impacted building. Sometimes send back up messages to the Emergency Wardens if it impacts all buildings) will notify the AHB Shelter in Place Building Coordinator and/or Back-Up of the need to Shelter in Place.
- Shelter in Place Coordinator and/or Back-up Coordinator will notify all Emergency Wardens of AHB (by e-mail, phone, or word of mouth) of Shelter in Place situation. The Emergency Wardens are in turn responsible to relay the Shelter in Place message to their floor occupants and direct them to designated safe areas.
- AHB Shelter in Place Coordinator notifies AHB security officer on-duty of situation if he/she does not know.
- From the security officer's station the AHB Shelter in Place Coordinator gets the lime green vest and AHB Shelter in Place Plan document. This document should also be located in safety room(s) (146/152, 119, 102,). AHB front door guard remains at the door with the radio.
- Security officer will lock front doors and 5th floor access to IHV by calling police station. Card access from outside can be stopped by from Pine Street station. The guard will have to remove any temporary hold opens in use.
- Building coordinator(s) and Emergency Wardens will direct building occupants to designated safe areas. Any building occupant that does not follow immediately is on their own. *** Note: If building occupants are in laboratory, reduce all operations to a safe condition as quickly as possible. This might include terminating chemical reactions or processes; disposing of hazardous chemicals that are in use; securing radioactive materials; and putting away cultures, potentially infectious materials, and securing animals. The sash on chemical fume hoods should be pulled down to the fully closed position. Discontinue any laboratory process that might create a hazard if chemical fume hoods, biosafety cabinets, or building ventilation were turned off. Shut laboratory doors.

- Safe areas for AHB are the following: Room 119, 102, 146/152 (all connected). If all building patrons are not in one place, Emergency Wardens, once notified, will use whistles to communicate that a Shelter-In-Place situation is occurring. Building patrons (faculty, staff, students) will know beforehand what the whistles signify. Visitors will be instructed accordingly. **It is expected that all building patrons make it to the designated rooms within 10 minutes.**
- Discourage any use of building elevators during any emergency. Elevators affect the airflow in the buildings (exchange of outside and inside air) and the shelter in place situation may be in effect secondary to an airborne threat outside the building.
- AHB's HVAC system is centrally controlled so any changes to this system needed during a shelter in place situation will be managed centrally by campus facilities.
- Emergency Wardens will help circulate sign-in lists for all building occupants in designated safe areas. These lists will be provided and updated every semester (by respective Department or School) for faculty, staff, and students normally present in the building on any given day.
- Campus Emergency Announcements (Telephone) will have updates available 410.706.8622 or check <http://www.umaryland.edu/alerts> on the web.
- Establish Communication Center in designated safe area: Room 102. Verify link with Emergency Management Command Center. This may be through phone (6-7570), web, email (emteam@af.umaryland.edu, rowan@af.umaryland.edu), or 2-way radio.
- Monitor web and 2-way radios (with the building security guard) for situation updates and communicate to building occupants.
- When the "all clear" is given, communicate to all occupants and any instructions about resuming business or evacuating the campus as appropriate.

II. Supplies Needed

- First Aid Kit (located in Room 119)
- Lime Green Shelter in Place Building Coordinator Vest at Security Officer's desk
- Manual with Shelter in Place Building Plan for AHB located at Security Officer's desk and in Room 119
- Land line phone in Designated Safe Area
- Computer in Designated Safe Area
- Cell phone

III. Important Resources

- [Campus Alerts Page](http://www.umaryland.edu/alerts) – (<http://www.umaryland.edu/alerts>) or 6-8622
- University of Maryland Baltimore's [Emergency Preparedness Plan](http://www.umaryland.edu/alerts/emergencyManagementPlan.pdf) (<http://www.umaryland.edu/alerts/emergencyManagementPlan.pdf> - see section IV: Emergency Management Elements – Part D: Public Protection Options).
- [Shelter-In-Places Guidelines](http://www.umaryland.edu/alerts/ShelterInPlace.pdf) – (<http://www.umaryland.edu/alerts/ShelterInPlace.pdf>)

IV. Emergency Contact Information

- Campus Police – Emergency 711
- Campus Police – Information 6-6882
- Facilities Work Control 6-7570
- Emergency Command Center 6-7570
- Campus Emergency Announcements 6-8622

- Environmental Health and Safety 6-7055
- Emergency Management Director 6-7222
- Counseling Center 8-8404

V. Key People

- Allied Health Building Shelter in Place Coordinator, Jeff Hawk, Room 201 of AHB, 410.706.5214, jhawk@som.umaryland.edu
- Back-Up Allied Health Building Shelter in Place Coordinator, Karen Sack, Room 131A of AHB, 410.706.4584, ksack@som.umaryland.edu
- AHB Guard Desk, 410.706.0410
- AHB Emergency Wardens:
 - 1st Floor
 - Karen Sack, 410.706.4584, ksack@som.umaryland.edu , Room 131
 - Joyce Johnson, 410.706.7721, jjohnson@som.umaryland.edu, Room 115
 - 2nd Floor
 - Jeff Hawk, 410.706.5214, jhawk@som.umaryland.edu , Room 201
 - Vincent Conroy, 410.706.4312, vconroy@som.umaryland.edu , Room 240 G
 - 3rd Floor
 - Belzora Joppy, 410.706.5158, bjoppy@som.umaryland.edu , Room 360
 - Brian Smith, 410.706.5200, bdsmith@som.umaryland.edu, Room 315
 - Joanne Manning, 410.706.7728, jmanning@som.umaryland.edu, Room 340A
 - 4th Floor
 - Donna Shaw, 410.706.3771, dshaw@som.umaryland.edu , Room 415B
 - Abe Baalness, 410.706.5158, abaalness@som.umaryland.edu, Room 460
 - 5th Floor
 - Tom Dowling, 410.706.0884, tdowling@rx.umaryland.edu, 540D
 - Chanel Agness, 410-706-5535, cagness@rx.umaryland.edu, 540
 - Charmaine Gregg, 410-706-6522, cgregg@rx.umaryland.edu, 540
 - Gary Butterbaugh, 410-706-2972, gbuterba@rx.umrayland.edu, 542

VI. General Guidelines

- A. In the event of an **AIR BORNE OR CHEMICAL** incident:
- The Building Coordinator and/or Emergency Wardens will direct building occupants to Shelter in Place designated safe areas (119, 102, 146/152) unless otherwise instructed. If you are already in one of these places at the time of the announcement, you should remain in your area.
 - In the event of this type of emergency, the campus can automatically shut down the air handling system in the building to provide further support in controlling ventilation.
 - Building occupants should shelter in place until the danger has passed typically within a few hours.
 - Once you enter a room it is suggested that building occupants refrain from leaving. Exiting a room may let contaminants in and endanger others in the room.
- B. If there is an incident which involves **RADIATION**:
- The Building Coordinator and/or Emergency Wardens will instruct staff to Shelter in Place by going quickly to the following rooms: 119, 102, 146/152.

C. In the event of a **TORNADO or EARTHQUAKE:**

- Building Coordinators and/or Emergency Wardens should instruct people in the building to seek shelter in rooms 119,102, 146/152.
- If there is no time to get to the designated rooms, people may retreat to interior areas of the building or office, away from windows & objects that may pull loose.
- Do not leave the building during an earthquake or tornado. Most injuries occur to people trying to leave a building and being hit by falling or flying objects.

VII. Additional Information

When Sheltering in Place:

The AHB security officer should lock our front doors. Anyone leaving the building will not be permitted to re-enter once the front doors have been locked. The Building Coordinator or Emergency Warden from each floor will instruct staff on where to go. Once the Emergency Wardens have reached safety, within 10 minutes the shelter room doors should be closed.

Any Emergency Warden who feels they are unable to perform these duties should inform the Shelter in Place coordinator and other arrangements will be made to cover their area. An alternate person will be selected to receive instructions in the event of an emergency other than fire.

Once the all clear is given by campus or city emergency personnel, staff will be instructed on the safest route to exit the city. Signs are posted throughout the city indicating evacuation routes. If these routes are changed, additional signs will be posted.

An example of when we would not Shelter in Place:

If our building is involved in a FIRE, DIRECT HIT OR EXPLOSION:

- When there is an immediate danger, building occupants should immediately report to the nearest fire exits and meet across the street from the front of the building (or other designated area) and await instruction.
- Emergency Wardens should immediately clear their area and should follow normal procedures of documenting that the building floors have been cleared and what injuries exist.

VIII. AHB – Shelter In Place – Phone Tree

This is assuming the alert is given to Building Coordinator, Building Coordinator Back-Up, or AHB Front Guard Desk. An email should be sent out prior to calling (use distribution list).

Scenario 1:

Alert comes from campus → Hawk (6-5214)→Sack (6-4584) → Guard Desk (6-0410) → Conroy (6-4312) → Smith (6-5200) or Manning (6-7728) or Joppy (6-5158)

Scenario 2:

Alert comes from campus → Sack (6-4584) → Hawk (6-5214) → Guard Desk (6-0410) → Conroy (6-4312) → Smith (6-5200) or Manning (6-7728) or Joppy (6-5158)

Scenario 3:

Alert comes from campus → Guard Desk (6-0410) → Hawk (6-5214)→ Sack (6-4584) → Conroy (6-4312) → Smith (6-5200) or Manning (6-7728) or Joppy (6-5158)

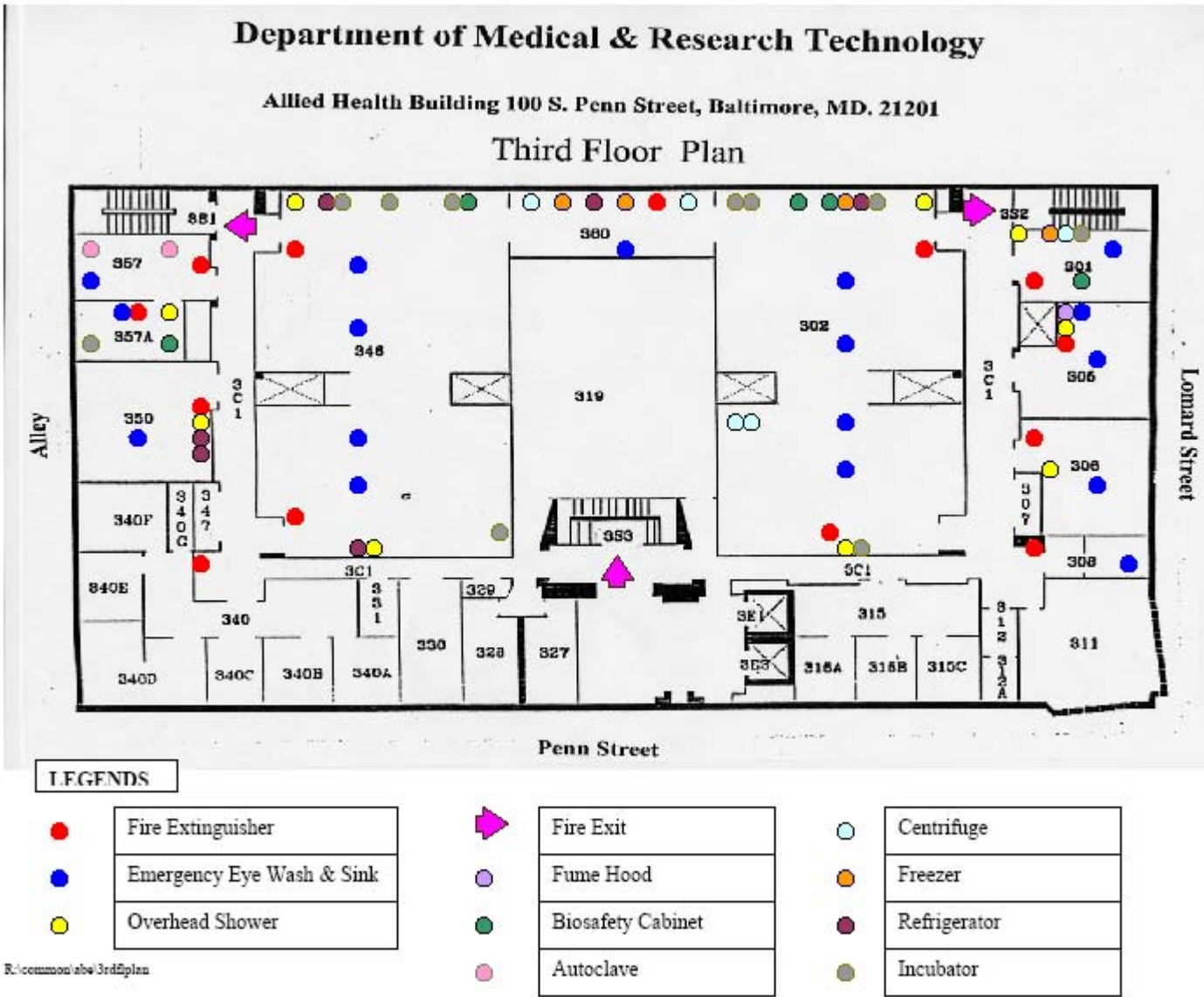
Once 3rd Floor Emergency Wardens are notified (Smith, Joppy, or Manning) they are responsible for getting in touch with at least one person on 4th Floor (Shaw 6-3771 or Baalness 6-5158). Once fourth floor is notified, 4th floor Emergency Wardens are responsible to call remaining 4th floor Emergency Wardens and also call 5th floor (Dowling 6-0884, Agness 6-5535, Gregg 6-6522, Buterbaugh 6-2972).

If you can not reach someone by phone you must go to their floor to notify.

IX. Shelter in Place Kit- Supply List

| | | |
|--|----|------------|
| Blood pressure cuff | 1 | |
| Stethoscope | 1 | |
| Trauma Dressing (10"x30") | 2 | |
| Infectious waste trash bags | 2 | |
| Sam splint (36") | 2 | |
| Adult CPR pocket mask | 1 | |
| Pediatric CPR pocket mask | 1 | |
| CPR microshield- clear mouth barrier | 1 | |
| Oral airway kit (1 each of sizes 1-6) | 1 | |
| Rubber glove set | 4 | |
| Instant cold pack | 2 | |
| Band-aids (box of 50) | 1 | |
| First Aid adhesive tape (1"x 5 yds) | 2 | |
| First Aid adhesive tape (.5" cm x 5 yds) | 2 | |
| Eye wash | 2 | |
| Hydrogen peroxide (8 fl oz) | 1 | Exp. 10/09 |
| Emergency blanket | 1 | |
| Oval eye pad | 4 | |
| Triangular bandage (40"x 40"x 56") | 2 | |
| Ace bandage (3") | 1 | |
| Ace bandage (4") | 1 | |
| Povidone iodine swabstick | 10 | |
| Koolaburn Sterile Finger Wrap | 2 | |
| Koolaburn Sterile arm/Leg Wrap (3"x 36") | 2 | |
| Koolaburn Sterile arm/Leg Wrap (8"x 36") | 1 | |
| Kendall Conforming Gauze Bandage (4"x 4.1yd) | 2 | |
| Kendall Conforming Gauze Bandage (3"x 4.1yd) | 2 | |
| Finger Gauze (2") | 2 | |
| Bloodstopper Dressing | 2 | |
| Antiseptic Pump Spray | 1 | |
| IPECAC oral solution | 1 | Exp. 03/10 |
| Glucose15 oral glucose gel | 1 | |
| Actidose-Aqua activated charcoal suspension | 1 | |
| Pen flashlight | 1 | |
| Bite stick | 1 | |
| Scissors | 1 | |
| Hemostat | 1 | |
| Ring cutter | 1 | |
| Cervical collar | 1 | |

Appendix A: Floor Plans

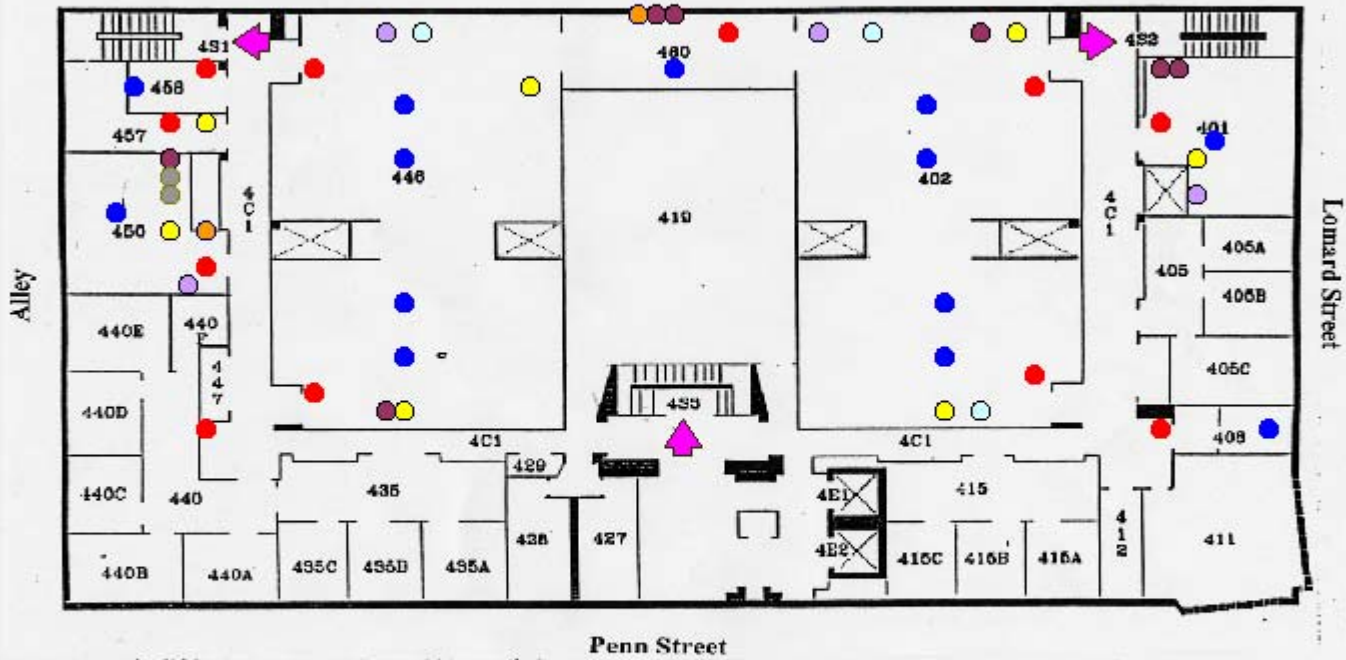


A-1

Department of Medical & Research Technology

Allied Health Building 100 S. Penn Street, Baltimore, MD. 21201

Fourth Floor Plan



LEGENDS

| | |
|---|---------------------------|
| ● | Fire Extinguisher |
| ● | Emergency Eye Wash & Sink |
| ● | Overhead Shower |

| | |
|---|------------|
| ➔ | Fire Exit |
| ● | Fume Hood |
| ● | Centrifuge |

| | |
|---|--------------|
| ● | Freezer |
| ● | Refrigerator |
| ● | Incubator |

R:\common\abe\4thflplan

Appendix B

Accident & Injury Report Form

A-3

Department of Medical and Research Technology

Accident and Injury Report Form

| |
|---|
| 1. Name of injured person |
| |
| 2. Date of injury |
| |
| 3. Name of person first contacted about the injury (supervisor/instructor) |
| |
| 4. Description of injury |
| |
| 5. How did accident occur? (describe fully) |
| |
| |
| 6. What was person doing when injured (be specific) |
| |
| |
| 7. Name of object which injured individual |
| |
| 8. Was safety equipment provided? |
| |
| 9. Was safety equipment in use at time of injury? |
| |
| 10. Was accident caused by injured 's failure to use or observe safety regulations? |
| |
| 11. Was injured person treated at the scene of accident or sent to doctor ? (student health) |
| |
| 12. If treated at scene of accident, describe treatment |
| |
| |
| 13. Did injured person return to school or work, if so time and date |
| |
| 14. Follow up |
| |
| |
| |
| 15. Signature of person filing report |

Appendix C

MSDS Form, **Hazardous/ Chemical Waste Removal Form**

EHS link for Chemical Waste Removal Form @:

http://www.ehs.umaryland.edu/waste/waste_removal_request_forms.cfm

EHS provides a website for MSDS resources @:

<http://www.ehs.umaryland.edu/misc/links.cfm>

An example of a Blank MSDS Form:

Source : <http://www.osha.gov/Publications/MSDS/msdsform.html>



Material Safety Data Sheet

U.S. Department of Labor

May be used to comply with

Occupational Safety and Health Administration

OSHA's Hazard Communication Standard,

(Non-Mandatory Form)

29 CFR 1910.1200. Standard must be consulted for specific requirements.

Form Approved
OMB No. 1218-0072

IDENTITY (*As Used on Label and List*)

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

| | |
|--|---|
| Manufacturer's Name | Emergency Telephone Number |
| Address (<i>Number, Street, City, State, and ZIP Code</i>) | Telephone Number for Information |
| | Date Prepared |
| | Signature of Preparer (<i>optional</i>) |

Section II - Hazard Ingredients/Identity Information

| Hazardous Components (Specific Chemical Identity; Common Name(s)) | OSHA PEL | ACGIH TLV | Other Limits Recommended | %(<i>optional</i>) |
|---|----------|-----------|--------------------------|----------------------|
| | | | | |
| | | | | |
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| |

Section III - Physical/Chemical Characteristics

| | | | |
|-------------------------|-----|---|-------|
| Boiling Point | | Specific Gravity (H ₂ O = 1) | |
| Vapor Pressure (mm Hg.) | | Melting Point | |
| Vapor Density (AIR = 1) | | Evaporation Rate (Butyl Acetate = 1) | |
| Solubility | in | | Water |
| Appearance | and | | Odor |

Section IV - Fire and Explosion Hazard Data

| | | | |
|---------------------------|------------------|----------|-------------------|
| Flash Point (Method Used) | Flammable Limits | LEL | UEL |
| Extinguishing | Media | | |
| Special | Fire | Fighting | Procedures |
| | | | |
| Unusual | Fire | and | Explosion Hazards |
| | | | |

Section V - Reactivity Data

| | | | | | |
|---------------------------------------|----------------|--|------------|----|-------|
| Stability | Unstable | | Conditions | to | Avoid |
| | Stable | | | | |
| Incompatibility (Materials to Avoid) | | | | | |
| Hazardous Decomposition or Byproducts | | | | | |
| Hazardous Polymerization | May Occur | | Conditions | to | Avoid |
| | Will Not Occur | | | | |

Section VI - Health Hazard Data

| | | | |
|--|-------------|------------------|-----------------|
| Route(s) of Entry: | Inhalation? | Skin? | Ingestion? |
| Health Hazards (Acute and Chronic) | | | |
| | | | |
| | | | |
| Carcinogenicity: | NTP? | IARC Monographs? | OSHA Regulated? |
| | | | |
| Signs and Symptoms of Exposure | | | |
| | | | |
| Medical Generally Aggravated by Exposure | | | Conditions |
| | | | |
| Emergency and First Aid Procedures | | | |
| | | | |

Section VII - Precautions for Safe Handling and Use

| | | |
|---|-------------|--------|
| Steps to Be Taken in Case Material is Released or Spilled | | |
| | | |
| | | |
| Waste | Disposal | Method |
| | | |
| Precautions to Be Taken in Handling and Storing | | |
| | | |
| Other | Precautions | |
| | | |

Section VIII - Control Measures

| | | |
|------------------------|-------------------------------|----------------|
| Respiratory Protection | | (Specify Type) |
| Ventilation | Local Exhaust | Special |
| | Mechanical (<i>General</i>) | Other |
| Protective Gloves | Eye | Protection |
| Other | Protective Clothing | or Equipment |
| Work/Hygienic | Practices | |