



MARQUETTE
UNIVERSITY

College of Health Sciences
Medical Laboratory Science

POLICIES AND PROCEDURES

For MLSC Freshman, Sophomore, Junior, and
First-Year Baccalaureate Certificate Students

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GENERAL DEPARTMENTAL POLICIES AND PROCEDURES

The Medical Laboratory Science Program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences, 5600 N. River Road, Suite 720, Rosemont, IL 60018; (773) 714-8880. Upon successful completion of coursework, students are eligible for the appropriate certification and/or licensure examinations. The University assumes no responsibility for the success of its students in obtaining professional certification or licensure.

As a student enrolled in this accredited program, you are entitled to certain information about the program. This information appears in several Marquette University publications but the *Undergraduate Bulletin* for the year you matriculated is your primary source since this represents the University's contract with you. The Bulletin is available at <http://bulletin.marquette.edu/undergrad/>. We are required by the accrediting agency to secure the signature of each student, indicating full understanding of the policies for progression in and completion of the program.

The Medical Laboratory Science major is a direct admit four-year curriculum leading to a Bachelor of Science degree. The first three years are fully spent on campus. The first twelve weeks of the fourth year are spent on campus, while the remainder of the senior year is spent at a clinical site. Marquette University admits no more students into the major than can be accommodated during the senior-year clinical internship. Students are assigned to the clinical affiliation by a matching process that includes student preference, hospital preference, and junior-year Medical Laboratory Science course attendance and performance. As long as the student follows the prescribed curriculum and meet the academic and professional regulations, a clinical placement will be assigned and the baccalaureate student can be graduated in four years.

A baccalaureate certificate is also offered by the Marquette University Medical Laboratory Science program. This two-year plan entails one full year of didactic- and laboratory-based curriculum (frequently in synchrony with the baccalaureate junior-year), with the second year involving the on-campus and clinical rotation scheduled described above.

Departmental Learning Outcomes: At graduation, the student will be able to:

1. Demonstrate entry-level knowledge of Medical Laboratory Science
2. Analyze human biological specimens according to established protocol for accuracy and precision for each scientific discipline within the medical laboratory
3. Effectively communicate the results of scientific analysis to professional colleagues
4. Exhibit values consistent with ethical Medical Laboratory Science practice.

Essential Functions: Certain essential functions represent the non-academic requirements of the program that a student must possess/achieve to successfully complete the program and become employable. These include:

1. Ability to distinguish colors
2. Ability to learn to perform and interpret highly complex testing methods
3. Ability to disseminate information in an accurate and confidential manner
4. Possess good tactile skills
5. Possess adequate physical and emotional health to work under stress and time constraints
6. Demonstrate respect and care for others
7. Work efficiently and accurately in a medical laboratory environment which often includes:
 - Loud noises
 - Strong odors
 - Biohazardous materials
 - Repetitive motions
 - Standing for long periods of time

Not only do regulations regarding dress in the laboratory exist to meet safety protocol, students should also be aware that dress codes exist at each clinical site (which may be site-specific). However, certain basic rules apply to all. All students must be well-groomed and maintain good personal hygiene. Hair, nails, and jewelry should not present a safety biohazard. Typically, visible body piercings must be removed and tattoos must be covered.

Prior to senior year students must:

1. Provide proof of immunization for specified vaccine-preventable diseases
2. Provide documentation of medical insurance coverage
3. Submit to a criminal background check
4. Meet any requirements set forth by their assigned clinical site (e.g., physical examination, drug screening, additional immunizations, *etc.*).

If, at any time, you have questions or wish clarification on an issue, please feel free to talk to your advisor or any Medical Laboratory Science faculty member.

ATTENDANCE POLICY

The pre-clinical Medical Laboratory Science courses, namely MLSC 1200, MLSC 2200, MLSC 4124/7124, MLSC 4127/7127, MLSC 4163/7163, MLSC 4173/7173, and MLSC 4174/7174, represent your entrance into this laboratory profession. As such, students will be assuming many of the responsibilities of a professional laboratorian. Some of these include accountability, reliability, and promptness demonstrated toward patients, fellow laboratorians, and other health professionals.

Therefore, all students in MLSC 1200, 2200, 4124/7124, 4127/7127, 4163/7163, 4173/7173, and 4174/7174 **MUST** attend every scheduled lecture, discussion, and laboratory session. Students are expected to arrive **ON TIME** for the start of class and to stay and be engaged (outside of electronic devices) for the full time scheduled. Since all of the material presented in every Medical Laboratory Science course is essential to professional practice, efforts **MUST** be made for makeup work regardless of whether or not an excused absence was granted. A student who is tardy for any written or practical assessment will normally not be granted any extra time for completing the assessment.

NOTE: Additional information regarding attendance of MLSC 4180-4189 coursework is detailed in the *Policies and Procedures for the Clinical Year* document.

Visit Marquette's What to do if you are exposed to COVID-19 or test positive website (www.marquette.edu/medical-clinic/covid19isolation-testing.php) for university guidelines on the best course of action.

REPORTING ABSENCES

Illness or any other unexpected absence must be reported by telephone or e-mail to the faculty member whose class you will miss. This will enable the faculty to save appropriate material for the student to use in making up the missed work. Per University policy, illness is treated as an unexcused absence.

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EXCESSIVE ABSENCES/TARDINESS

Cumulative attendance records are maintained in the Medical Laboratory Science Department and become a permanent part of the student record. These records enable the faculty to evaluate student professionalism and provide documentation of student dependability for employment references, scholarships, financial aid, and graduate/professional school. Students who develop a pattern of excessive absences or tardiness will be issued a WA (withdrawal due to excessive absences) grade in the course. More than one (1) WA in MLSC courses will result in withdrawal from the major. Both excused and unexcused absences contribute to the “WA count.”

Students enrolled in Medical Laboratory Science courses will receive sufficient warning that they are in jeopardy of receiving a grade of WA. A warning will be issued to the student after four (4) absences/tardies combined. A strict warning (such that one additional violation will result in a grade of WA) will be issued to the student after five (5) absences/tardies combined. The grade of WA will be issued to the student after six (6) absences/tardies combined.

Students enrolled in MLSC 1200 will receive sufficient warning that they are in jeopardy of receiving a grade of WA. A warning will be issued to the student after one (1) absence/tardy

combined. A strict warning (such that one additional violation will result in a grade of WA) will be issued to the student after two (2) absences/tardies combined. The grade of WA will be issued to the student after three (3) absences/tardies combined.

On days during which lecture and laboratory sessions are held, each session will be treated as a separate entity and contribute individually to the absence/tardy tally.

A student may appeal a WA grade. The appeal must be in writing and received by the Promotion and Progress Committee within two (2) days after receipt of the grade. The appeal will be considered by the appeals committee whose decision will be final. Excused absences and tardiness which have been explained to the instructor will be considered more favorably than unexcused or unexplained absences and tardiness.

REQUEST FOR EXCUSED ABSENCES

The University recognizes that there are times when students must miss class due to exigent circumstances. The following are considered excused obligations and not counted as absences in class:

1. Jury duty with documentation
2. Short-term military call-up as outlined in the Military Call to Active Duty or Training Policy (<https://bulletin.marquette.edu/undergrad/academicregulations/>)
3. Day(s) of religious observances (<https://www.marquette.edu/campus-ministry/>)
4. Participation in Division 1 athletics or other university-sanctioned events
 - a. This activity must be documented and provided to the faculty in advance of the activity
 - b. Documentation must be verified by an official of the University who is directly related to the activity (e.g., Division 1 athletic representative, musical group director, student development representative, *etc.*)

*Absences not listed above are UNEXCUSED. The ability to make up class work as a result of an unexcused absence is at the discretion of the faculty.

MARQUETTE COVID-19 POLICY CENTRAL (as of August 2024)

www.marquette.edu/central/registrar/faculty-staff/guidance-on-spring-2024-class-attendance-withdrawal-grading.php

C CLAUSE

Classroom and laboratory training at Marquette University as an underclassman establishes the foundation for the final-year clinical internship experience. These up-to-three years can also be viewed as the time when professional behaviors are established and nurtured on a daily basis. It is the responsibility of Marquette University Department of Medical Laboratory Science faculty to ensure that students are capable of stepping into a clinical internship location on day one and

performing basic medical laboratory functions (supervised) without potentially causing harm to patients. With this stated, the Marquette University Department of Medical Laboratory Science reserves the right NOT to assign clinical internship placement to a rising senior-year (second-year certificate) student in the face of one or more of the following circumstances:

1. Repeated overt and covert signs of disrespect toward fellow students;
2. Repeated overt and covert signs of disrespect toward Faculty;
3. Repeated instances of threatening behavior toward fellow students;
4. Repeated instances of threatening behavior toward Faculty;
5. Repeated instances of academic dishonesty;
6. Repeated instances of inability to follow laboratory protocol or instances of fabricating laboratory data (which may extrapolate to patient harm); and,
7. General lack of laboratory acumen and safety (which may extrapolate to patient harm)

Potential use of cybertechnology may also apply to the aforementioned circumstances. A simple barometer that can be used by Faculty with respect to this setting is the following question, “Do I want this student to analyze specimens from my family member?”

It is duly noted that use of the word “repeated” in this clause signifies that multiple interventions have been attempted by Marquette University Department of Medical Laboratory Science faculty to correct the affective or effective behavior described. All related matters will be forwarded to the Department of Medical Laboratory Science Progress and Promotion Committee which will finalize decisions.

GRADING POLICIES

The following grading scale is implemented into all components of the first- through third-year (including first-year certificate) MLSC curriculum:

A	94-100		
A-	91-93		
B+	88-90	C-	67-69
B	82-87	D+	64-66
B-	79-81	D	58-63
C+	76-78	D-	55-57
C	70-75	F	<56

All first- through third-year (including first-year certificate) MLSC courses require a score of $\geq 70\%$ or higher on the following elements: 1) final written examination; and, 2) final laboratory practical examination. Individual courses may list additional components that merit a score of $\geq 70\%$ or higher; students are advised to consult course syllabi. When not attained, remedial action will be required.

In the context of remedial action, assignment of the final grade in a first- through third-year (including first-year certificate) course follows these guidelines:

1. A make-up grade must meet the above stated criterion for satisfactory grades.
2. The final grade is derived from the initial grade earned, regardless of what that grade is. Rationale: The purpose of the make-up examination is to make certain the student has learned all of the essential material before she/he can proceed. The purpose is not to arrive at a grade.

Ultimately, with respect to first- through third-year (including first-year certificate) MLSC curriculum, students who do not achieve an overall course grade of $\geq 70\%$ or higher will be required to repeat the course. This circumstance will inevitably delay student graduation.

ACADEMIC DISHONESTY

Academic dishonesty will be treated according to the *Undergraduate Bulletin*, with matters forwarded to the Marquette University Academic Integrity Council. Examples of academic dishonesty include: 1) copying material from the internet or an artificial intelligence outlet and submitting it as one's own work; 2) quoting from a document without making proper reference; 3) copying answers from the exam or homework of another student; 4) working collaboratively on a take-home assignment or examination when instructions explicitly stated that the work be done individually; 5) impersonating another student; and, 6) and the illegitimate use of materials during an examination.

GENERAL LABORATORY BIOSAFETY PROCEDURES

The following safety policies and procedures are designed not only for your protection, but for the protection of those around you in the laboratory and those with whom you have contact outside of the laboratory environment. All regulations are based upon current safety protocol and Standard Precaution procedures established for clinical laboratories.

Standard Laboratory Practice List pertinent to medical/clinical laboratories (these will also be listed under each of the subcategories below)

1. Wash hands after entering and before exiting the laboratory
2. Tie back long hair
3. No open-toed footwear in the laboratory
4. No dangling earrings or scarves
5. Disinfect the workbench before and after use
6. No food, gum, drinks in the lab
7. Do not touch the face, apply cosmetics, adjust contact lenses, or bite nails
8. Do not handle personal items (cosmetics, smart phones, tablets, laptops, calculators, pens, pencils, *etc.*) while in the laboratory

9. No mouth pipetting
10. Label all containers clearly
11. Use proper transport vessels (i.e., test tube racks) for moving cultures and test tubes in the laboratory
12. Use leak-proof containers for storage and transport of infectious material
13. All biohazard waste will be autoclaved in the department before disposal
14. Do not handle broken glass with fingers--use the broom and dustpan provided in the laboratory
15. All sharps waste will be placed in the sharps containers on each laboratory bench
16. Notify instructors of all spills or injuries

Additional University-advocated laboratory biosafety information follows:

- I. To be informed about the substances one may be exposed to and proper handling of those substances
 - A. Complete information regarding workplace exposure to hazardous chemicals in laboratories is provided in the Department's Chemical Hygiene Plan found attached to this document and in the Laboratory Safety Manual. This handbook is located in SC290. A summary of the Occupational Exposure to Hazardous Chemicals in Laboratories has been included in this booklet. In addition to the General Rules and Standard Operating Procedures covered in that document, information regarding individual hazardous or toxic chemicals are available in SC290. MSDS sheets can be obtained from the website: <https://www.osha.gov/chemicaldata/>. This reference material addresses the hazards, safe handling, storage and disposal of hazardous chemicals.
 - B. A protocol regarding human immunodeficiency virus (HIV) and hepatitis B virus (HBV) transmission prevention is included later in this document.
 - C. A protocol for standard blood and body fluid precautions is included later in this document.
 - D. A protocol for dealing with spills and accidents is included later in this document.
- II. To protect oneself against ingestion of infectious, toxic, and caustic agents
 - A. Do not eat, drink, smoke, chew gum, handle contact lenses, or apply cosmetics or lip balm in the laboratory. Putting fingers, pencils, or other objects in the mouth is further prohibited. Hand-to-face contact must be avoided.
 - B. Food, gum, or drink storage is prohibited in the laboratory.
 - C. **No mouth pipetting is allowed.** You will be provided with pipetting bulbs or other devices.

- D. Wash your hands with an antiseptic soap after removing gloves. You must wash your hands thoroughly before leaving the laboratory. Hand washing is acceptable if you scrub for at least 20 seconds (or recite the alphabet) with an antiseptic soap, apply friction vigorously to the entire surface area, and rinse thoroughly.
- III. To protect the body and clothing against contamination, burns, or chemical spills
- A. A clean, full-length, non-permeable laboratory coat must be worn at all times. For maximum protection, laboratory coats must be snapped/buttoned and the laboratory coat sleeves may not be rolled up. To prevent spread of infection, laboratory coats are not allowed outside the laboratory area. Never eat while wearing a laboratory coat.
- **Notify your instructor immediately** if any specimen, reagent, or culture spills on your laboratory coat.
 - Do not take laboratory coats home for laundering--coats will be sent to a professional laundry as per OSHA requirements.
- B. Legs must be covered by the laboratory coat and/or under the laboratory bench for protection. Long pants are recommended.
- C. Wear closed-toe, liquid-repellent shoes. The following types of shoes should not be worn in the laboratory: sandals, open-toe, open-weave, canvas, tennis shoes made of absorbent materials.
- D. Hair, jewelry, and neck scarves should not be worn in a manner which would cause laboratory accidents (i.e., dangling in flames, cultures, specimens). Hairstyles which allow hair to fall in front of the face must be pulled back by bobby pins, barrettes, combs, or headbands. Hair that is long enough to be gathered at the nape of the neck must be tied back. Anything which could fall onto work areas (i.e., hats, scarves) may not be worn in the laboratory.
- IV. To prevent infection due to loss of integrity of the skin barrier (open cuts, burns, lesions)
- A. Come to the laboratory wearing a band-aid or request one from your instructor.
- B. Ask your instructor for gloves if the open skin area is too large for a band-aid. This also is good practice for those who have a skin condition such as eczema which leaves the skin dry and flaky.
- C. Gloves must be worn when handling blood or other body specimens. This is to prevent against accidental exposure to HIV, hepatitis B virus, or other bloodborne pathogens through unapparent cuts in the skin. Gloves should never be worn outside of the laboratory and should be discarded in an autoclave bag after use. Wash hands immediately after removing gloves. We provide nitrile gloves for use in our laboratories.

Do not wash or disinfect gloves for reuse; this could cause deterioration of the gloves with subsequent loss of barrier protection. Replace gloves when they become contaminated.

Gloves can tear or be punctured; therefore, bandage cuts or sores before donning gloves.

Gloves do not need to be worn during procedures which have no risk of contamination with body specimens. They do not need to be worn during microbiology laboratory when working with biosafety level 1 (BSL-1) organisms; however it is recommended that gloves be worn during all culture manipulations. Gloves must be worn when handling cultures in the Class II biosafety cabinet.

Use rubber household gloves for instrument cleaning and decontamination or for major cleaning jobs around the laboratory when contact with blood/body specimens is possible. These gloves can be decontaminated and reused. Replace gloves when they show signs of wear or cracks.

- V. To avoid possible damage and contamination of possessions or cluttering of your work area which could lead to accidents and to ensure the ability of all students to clearly hear all laboratory communication
 - A. Store all coats, books, *etc.* in your locker or on hallway hooks. Bring only those items to the laboratory which are essential to the day's work. *Electronic devices including cell phones and laptops may not be used in the laboratory.*
 - B. Do not use the area where you perform your experiments for recording results and writing reports. A pull-out ledge is provided at your workstation for this purpose.
 - C. Use pencils and pens supplied in your laboratory drawer. Do not bring your own pencils/pens into the laboratory.
- VI. To allow for good manual dexterity which will prevent accidents, fingernails cannot extend more than 1/4 inch beyond the tip of the finger.
- VII. To ensure an uncontaminated work environment
 - A. Disinfect your workspace at the beginning and end of the laboratory session. Many commercially-available disinfectants are effective against bacteria. These disinfectants are also effective against most viral agents which could be transmitted through infected blood. Currently, the recommended disinfectant is 10% bleach.

For any disinfectant to work properly, it must remain on the surface at least 5 minutes. Therefore, at the end of the laboratory session, liberally squirt disinfectant

onto the surface, spread it around with a paper towel, and allow it to air dry. Do not wipe the surface dry.

The purpose of disinfecting your workspace at the beginning of the laboratory session is to remove accumulated dust particles which could contaminate your specimen/cultures. Spread the disinfectant over the workspace and dry it immediately afterwards.

- B. Disinfect your workspace after any procedure which may have caused droplet contamination.
 - C. Custodial staff is charged with applying disinfectant solution to floors each night.
 - D. Windows are kept closed. Windowsills and the tops of cabinets/equipment are cleaned on a routine basis to reduce the risk of airborne contamination.
 - E. Incubators, water baths, student drawers, *etc.* are disinfected according to a set schedule.
- VIII. To properly dispose of materials without contaminating or otherwise endangering staff
- A. Place used paper towels, swabs, lens paper, *etc.* in the lined wax buckets on the laboratory bench.
 - B. Insert disposable pipettes, slides, needles, or other sharp objects into the biohazard sharps container on your laboratory bench. Never force an object into the container or fill the container more than 3/4 full. The container is capped and autoclaved before disposal as medical waste.
 - C. Use autoclave bags at the end of the laboratory period for discarding the contents of buckets, specimens, and cultures (never discard a specimen or culture unless directed to do so by your instructor). Bags will be sterilized in the autoclave before disposal.
 - D. Carefully place uncontaminated glass waste (e.g., broken or disposable) in the specially-labeled container. Never discard glass in the wastebasket--custodial staff could be injured while disposing of it.
 - E. Never pick up broken glass or unsheathed needles/sharps with your hands. Use a forceps or broom with dustpan.
- IX. To provide proper supervision/assistance in case of accident/emergency
- A. Students may not work alone in the laboratory; an instructor must be present.

- B. Faculty and staff are present in the department whenever laboratory is in session.
- X. To ensure proper functioning of laboratory equipment
- A. Report any malfunctions, no matter how minor, to the instructor.
 - B. Quality control (temperatures, pressures, *etc.*) is checked daily.
- XI. To prevent inhalation of aerosols and/or splashing of infectious or toxic substances
- A. Use the chemical fume hood when dispensing concentrated chemicals which produce toxic fumes.
 - B. Use the Class II biosafety cabinet when handling mold cultures, clinical specimens, and pathogenic microorganisms (BSL-2) which can easily become aerated.
 - C. Open blood tubes behind a splash shield and/or with a piece of gauze or tissue covering the stopper.
 - D. Work behind a splash shield when splashing of blood or body fluids is a possibility.
- XII. To protect the eyes
- A. Wear safety glasses/goggles when working in the laboratory with liquids. If anything splashes into the eye, flush the eye at the eye wash station.
 - B. Contact lens wearers should be aware that certain chemical fumes may cause irritation to the eye and/or fogging of the lenses. Contact lenses should be removed immediately if anything splashes into the eye. Avoid manipulation of lenses in the laboratory; if you must handle your lenses, first wash hands with antiseptic soap.
- XIII. To warn and protect others who enter the laboratory area
- A. All blood and body fluid specimens must be in leakproof containers.
 - B. Containers used for storage or transport of blood or potentially-infectious materials must be labeled with the biohazard symbol. Individual tubes do not need a label, but the racks holding them must be labeled.

BIOSAFETY IN MICROBIOLOGY

All of the above guidelines will be used in the microbiology laboratory. Levels of biosafety practice in microbiology are based on the risk to the student/worker in the laboratory.

A BSL-1 laboratory is suitable for work involving well-characterized microorganisms not known to consistently cause disease in immunocompetent adult humans. The organisms present minimal potential hazard to laboratory personnel and the environment. Work is typically conducted on open bench tops using standard procedures.

BSL-2 laboratory procedures are more stringent than BSL-1. Moderate-risk and clinically-relevant pathogens can be found in a BSL-2 laboratory. Such organisms can cause human disease but can be treated effectively. Specific practices exist to work with BSL-2 organisms.

Some BSL-2 microorganisms are utilized in MLSC teaching laboratories. Students must wear a laboratory coat, goggles, gloves, and closed-toed shoes. If the organism could be aerosolized, work **MUST** be performed in the class II biosafety cabinet in SC290. Each student will receive a list of microorganisms and their appropriate biosafety level.

ACCIDENT PROCEDURES

All accidents and injuries, no matter how minor, must be reported to the instructor in charge immediately.

I. Large spills on laboratory benches, floor, equipment

Remain in place and notify the instructor **IMMEDIATELY**. Moving before the spill is examined may contaminate/harm oneself or spread contamination through the laboratory.

1. Put on rubber household gloves.
2. Absorb the spill with disposable absorbent material; discard into an autoclave bag.
3. If the spill consists of blood or body fluid, clean it with household detergent. [Steps 2 and 3 are necessary to remove excess protein; most disinfectants are less effective if protein is present in high concentration.]
4. Place paper toweling over the spill site and saturate with disinfectant (10% bleach). [Caution: spraying disinfectant on the spill directly may create an aerosol which will spread the contamination.] After 15-20 minutes, put gloves back on and wipe up the spill area. Dispose of all paper towels in the autoclave bag. Disinfect the household gloves.

NOTE: Small splatters of infectious materials may be disinfected by simple swabbing of the area with disinfectant.

II. Chemical spills on the body

- A. If the spill only involves hands, rinse thoroughly and immediately in cold water.
- B. Large spills on the body or clothing must be rinsed off immediately with large volumes of water from the safety shower located in the hallway. Stand under the shower head and pull the chain.

III. Specimens or culture spills on the body

- A. If the spill only involves the hands, saturate with disinfectant then wash them with antiseptic soap.
- B. Large spills on the body or clothing require more complex decontamination. Do not use the safety shower--this would spread the infectious agent throughout the building. Remain in place and notify instructor **IMMEDIATELY**. Decontamination will involve use of disinfectants and/or autoclaving clothing.
- C. Microbiologic spill on the floor or countertop:
 - 1. All personnel should clear the area
 - 2. Notify the instructor
 - 3. Put on personal protective equipment prior to clean up
 - 4. Absorb the spill with paper towel
 - 5. Clean the spill site with 10% bleach
 - 6. Disinfect the spill site by placing 10% bleach over the spill area and allowing to air dry

IV. Materials in the eye

An eyewash station is mounted on the sink in the laboratory. Any material splashing in the eye should be **IMMEDIATELY** flushed out with large amounts of water as the best insurance against permanent damage to the tissues of the eye.

V. Wounds and burns

Any injury breaking or burning the skin must be reported to the instructor **IMMEDIATELY**. Appropriate first aid will be administered. If there is any doubt regarding the need for medical attention, students will be referred to a provider at the Marquette University Medical Clinic.

VI. Electrical shock

Shocks acquired from any piece of electrical equipment are reported to the instructor **IMMEDIATELY**. No attempts at repairing the equipment should be made. A wooden safety stick should be used to push an electrical cord away from an individual receiving an electric shock.

VII. Clothing fire

Clothing fires are dangerous because the victim has the understandable tendency to panic and run. It is important to remember that running will fan the flames and increase the chance of receiving serious burns. Burns can result to the neck, face, and head since flames rise upward when the person is sitting or standing.

Actions taken when clothing/hair catches fire could prevent serious and disfiguring burns.

ACT IMMEDIATELY! DO NOT PANIC--DO NOT RUN!

Some judgment can be used if the fire is small and is not spreading (e.g., a laboratory coat sleeve). If time allows, the coat can be removed or doused with water. If potential exists for the fire to spread quickly to the torso, clothing, or hair, the victim should lay down and smother the fire by slowly rolling on the ground. Another person can assist by smothering the fire with a fire blanket or anything available.

When using a fire blanket to smother a fire, it is important not to simply throw the blanket over the person (thereby trapping air which will permit burning to continue under the blanket). The blanket should be spread over the victim and smoothed out flat with the hand to exclude all air and, thus, smother the fire. **DO NOT FAN THE BLANKET.**

FIRE AND OTHER EMERGENCY PROCEDURES

- I. In case of fire
 - A. Notify the instructor in charge. Follow her/his instruction.
 - B. If the instructor is incapacitated
 1. Call Marquette University Police Department at (414) 288-1911. Give your name, the location of the fire, and a brief description.
 2. Activate the nearest fire alarm and notify Medical Laboratory Science staff or faculty.
 3. Leave the building via the nearest fire exit. **DO NOT USE ELEVATORS.**

NEVER ATTEMPT TO FIGHT A FIRE WITHOUT REPORTING IT FIRST

- II. The fire alarm nearest the laboratory area is located near the south staircase in the main hall (across from SC256). The repeating high-pitched whirring and a strobe light will alert you to the fire.
- III. Fire extinguishers
 - A. In event of fire, students will follow the directions of the instructor in charge to avoid danger to all individuals in the area.
 - B. The laboratory is equipped with carbon dioxide fire extinguishers. They are filled with five pounds of liquid carbon dioxide under pressure. When the valve is opened, the liquid changes to carbon dioxide gas with the absorption of heat.

- C. Carbon dioxide extinguishers are designed to combat type B (flammable liquids) and type C (electrical equipment) fires. They are not preferred for class A fires (paper, wood) since the gas leaves at such high velocity that it tends to blow loose burning debris around, worsening the situation. A bucket is located near the sink in each laboratory for carrying water to a small paper fire.
- D. Carbon dioxide is the choice for fires in delicate electrical instruments because it will not conduct electricity and leaves no residue.
- E. In the teaching laboratory, students will not be responsible for fighting a fire. However, in the clinical laboratory everyone shares the responsibility of fire protection. By being prepared, students are in a better position to follow the correct procedure in the event that an emergency occurs.

To operate a carbon dioxide extinguishers:

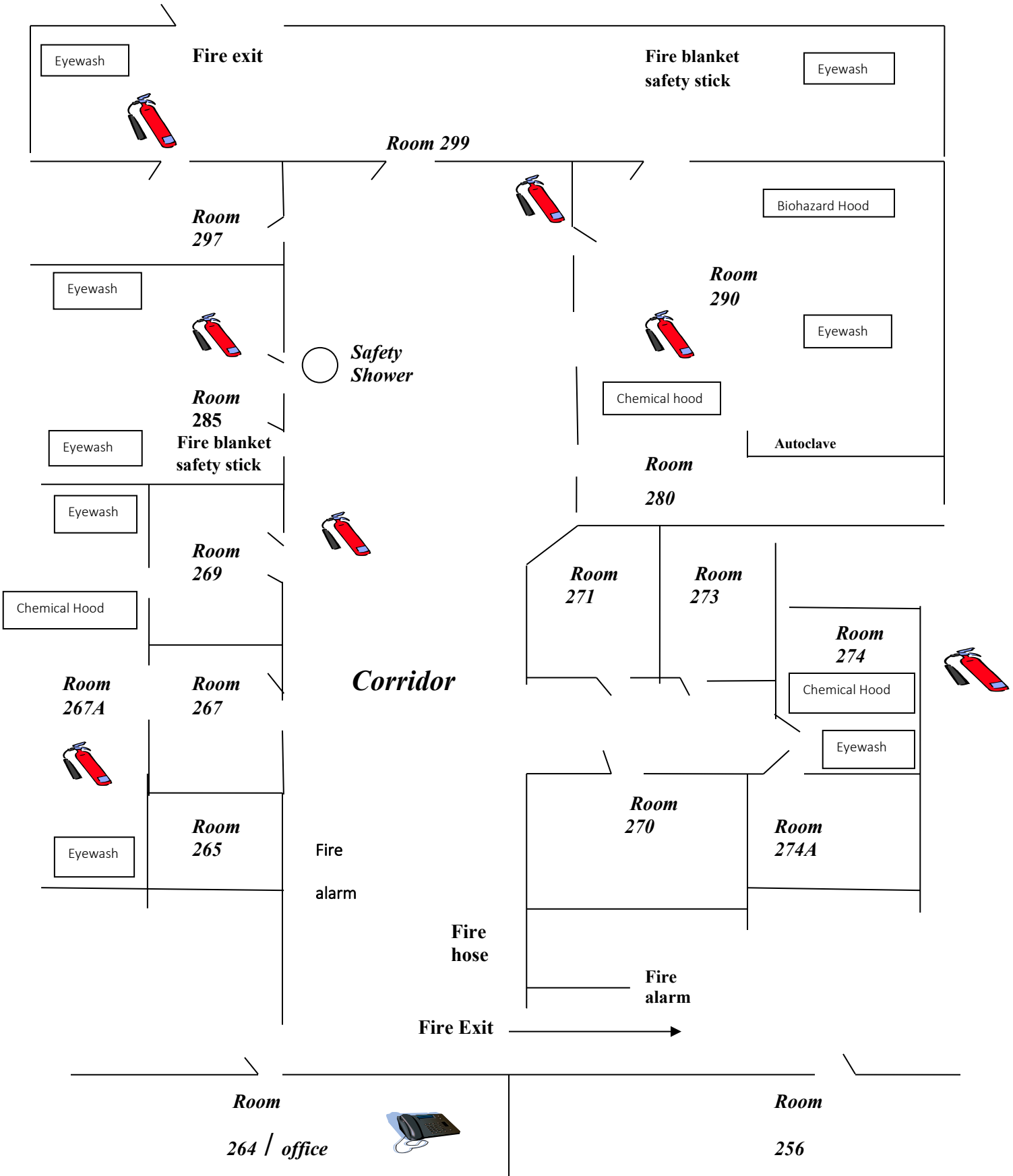
1. Carry erect by handle
2. Pull out pin and raise horn
3. Aim at the base of the fire
4. Squeeze valve grip to open valve
5. Sweep discharge from side-to-side until the flames are extinguished

NOTE: DON'T PANIC!! Be prepared for the roar of the extinguisher.

IV. Evacuation

- A. A departmental map is provided in this manual; maps are also posted in each laboratory showing the fire exits for Medical Laboratory Science personnel.
- B. NEVER USE THE ELEVATORS DURING A FIRE. Elevators are heat sensitive and may respond to the floor with the fire, instead of your desired destination, endangering your safety.
- C. If the prescribed evacuation route is blocked, carefully re-route to another available exit. Once outside, proceed away from the building to a safe or designated area.
- D. Remain calm. You will be the first priority of the Marquette University Police Department and the Milwaukee Fire Department.

- V. If a tornado is sighted in the Milwaukee area, a loud siren will sound. If this happens, move quickly via the closest staircase to the basement of the Schroeder Complex. Remain within the corridor, away from windows. Wait for the all-clear signal by siren or Marquette University Police Department personnel.



BLOOD-BORNE PATHOGENS

INTRODUCTION

HIV, the virus that causes acquired immunodeficiency syndrome (AIDS), is transmitted by exposure to infected blood or blood components, exchange of bodily fluids, and perinatally from mother to neonate. HIV has been isolated from blood, semen, cervical secretions, saliva, tears, breast milk, cerebrospinal fluid, amniotic fluid, and urine and is likely to be isolated from other body fluids and infected tissues.

HBV is transmitted through exposure to infected blood or blood components and exchange of bodily fluids. This virus has been isolated from blood, urine, semen, cerebrospinal fluid, and saliva. HBV has been found to be viable in dried blood or blood components for several days. The potential for HBV transmission is greater than HIV. Hepatitis C virus (HCV) can also be transmitted through blood and blood components, but less than HBV.

HIV and HBV can be transmitted in occupational settings only by percutaneous inoculation or contact with an open wound, nonintact (e.g., chapped, abraded, weeping, or dermatitic) skin, mucous membranes to blood, blood-contaminated body fluids, or concentrated virus. Blood is the single most important source of HIV and HBV in the workplace setting. Protection measures against HIV and HBV for workers should focus primarily on preventing these types of exposures to blood as well as on delivery of HBV immunization.

The risk of HBV infection following a parenteral (i.e., needle stick or cut) exposure to blood is directly proportional to the probability that the blood contains HBV surface antigen (HBsAg), the immunity status of the recipient, and on the efficiency of transmission. Of persons who have not had prior HBV vaccination or post-exposure prophylaxis, 6-30% of persons who receive a needlestick exposure from an HBsAg-positive individual will become infected.

The risk of infection with HIV following one needlestick exposure to blood from a patient known to be infected with HIV is approximately 0.5%. This rate of transmission is considerably lower than that for HBV, probably a result of the significantly lower concentrations of virus in the blood of HIV-infected persons. Though inadequately quantified, the risk from exposure of nonintact skin or mucous membranes is likely to be far less than that from percutaneous inoculation.

STANDARD PRECAUTIONS

Standard precautions is an approach to infection control to treat all specimens in the laboratory as if they are infectious (i.e., containing HIV, HBV, and other bloodborne pathogens). In the hospital and other healthcare settings, standard precautions should be followed when workers are exposed to blood, certain other body fluids (amniotic fluid, pericardial fluid, peritoneal fluid, pleural fluid, synovial fluid, semen, and vaginal secretions), or any body fluid visibly contaminated with blood.

- A. All healthcare workers should routinely use appropriate barrier precautions to prevent skin and mucous membrane exposure when contact with blood or other body fluids of any patient is anticipated.
 - 1. Gloves should be worn for touching blood and body fluids, mucous membranes, or non-intact skin of all patients, for handling items or surfaces soiled with blood or body fluids, and for performing venipuncture and other vascular access procedures. Gloves should be changed after contact with each patient.
 - 2. Masks and protective eyewear or face shields should be worn during procedures that are likely to generate droplets of blood or other body fluids to prevent exposure of mucous membranes of the mouth, nose, and eyes. Gowns or aprons should be worn during procedures that are likely to generate splashes of blood or other body fluids.
- B. Hands and other skin surfaces should be washed immediately and thoroughly if contaminated with blood or other body fluids to which standard precautions apply or potentially-contaminated articles. Hands should always be washed after gloves are removed, even if the gloves appear to be intact.
- C. All healthcare workers should take precautions to prevent injuries caused by sharps, such as needles. To prevent needlestick injuries, needles should not be recapped or otherwise manipulated by hand. After utilization, sharp items should be placed into puncture-resistant containers for disposal.
- D. Although saliva has not been implicated in HIV transmission, mouthpieces, resuscitation bags, or other ventilation devices should be available for use in areas in which the need for resuscitation is predictable.
- E. Healthcare workers who have exudative lesions or weeping dermatitis should refrain from all direct patient care and from handling patient care equipment until the condition resolves.
- F. Pregnant healthcare workers are not known to be at greater risk of contracting HIV infection than healthcare workers who are not pregnant; however, if a healthcare worker develops HIV infection during pregnancy, the infant is at risk of infection resulting from perinatal transmission.

PRECAUTIONS FOR LABORATORIES

To supplement the standard precautions listed above, the following precautions are recommended for healthcare workers in medical laboratories.

- A. All specimens of blood and body fluids should be put in a well-constructed container with a secure lid to prevent leaking during transport. Care should be taken when collecting each

specimen to avoid contaminating the outside of the container and the laboratory paperwork accompanying the specimen.

- B. All persons processing clinical specimens (e.g., removing tops from vacuum tubes) should wear gloves. Masks and protective eyewear should be worn if mucous membrane contact with blood and body fluids is anticipated. Gloves should be changed and hands washed after completion of specimen processing.
- C. For routine procedures, such as histologic/pathologic studies or microbiologic culturing, a biosafety cabinet is not necessary, but preferred. However, biosafety cabinets (Class I or II) should be used whenever procedures are conducted that have a high potential for generating droplets (aerosols). These include activities such as blending, sonicating, and vigorous mixing or when respiratory specimens are processed.
- D. Mechanical pipetting devices should be used for manipulating all liquids in the laboratory. Mouth pipetting must not be performed.
- E. Use of needles and syringes should be limited to situations in which there is no alternative; the recommendation for preventing injuries with needles outlined under standard precautions should be followed.
- F. Laboratory work surfaces should be decontaminated with an appropriate chemical germicide after a spill of blood or other body fluids and when work activities are completed.
- G. Contaminated materials used in tests should be decontaminated before processing or be placed in bags and disposed of in accordance with institutional policies for disposal of infective waste.
- H. Scientific equipment that has been contaminated with blood or other body fluids should be decontaminated and cleaned before being repaired in the laboratory or transported to the manufacturer.
- I. All persons should wash their hands after completing laboratory activities and should remove protective clothing before leaving the laboratory.

CLEANING AND DECONTAMINATING SPILLS OF BLOOD

- A. All spills of blood and blood-contaminated fluids should be promptly cleaned up using an EPA-approved germicide or a 10% solution of household bleach in the following manner while wearing gloves.
 - 1. Visible material should first be removed with disposable towels or other appropriate means that will ensure against direct contact with blood.

2. If splashing is anticipated, protective eyewear should be worn along with an impervious gown or apron which provides an effective barrier to splashes.
 3. The area should then be decontaminated with an appropriate germicide.
 4. Hands should be washed following removal of gloves. Soiled cleaning equipment should be cleaned and decontaminated or placed in an appropriate container and disposed of according to agency policy.
- B. Plastic bags should be available for removal of contaminated items from the site of the spill.

OCCUPATIONAL EXPOSURE TO HAZARDOUS CHEMICALS IN LABORATORIES

An OSHA standard has been developed to protect laboratory personnel from the dangers (health and safety) associated with the use of hazardous chemicals in the workplace. Information regarding the limits of exposure and safe practices associated with hazardous chemicals is provided in two formats: 1) Chemical Hygiene Plan; and, 2) Material Safety Data Sheets (MSDS).

The laboratory worker can obtain the following information about a specific chemical from the MSDS supplied by the manufacturer/distributor of the chemical:

- Product name and hazard rating according to NFPA criteria
- Physical properties
- First aid measures
- Health hazard information
- Hazardous reactivity
- Spill, leak and disposal procedures
- Special precautions

Many of the safety regulations defined in this handbook are based on the basic rules and general operating procedures of the Department's Chemical Hygiene Plan. If you wish to read the entire OSHA standard and the Chemical Hygiene Plan, please ask the instructor.

REFERENCES

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**MARQUETTE UNIVERSITY DEPARTMENT OF MEDICAL LABORATORY SCIENCE
Policies and Procedures**

Freshman, Sophomore, Junior, First-year Certificate Student Sign-off Sheet

As you read and study this handbook, please check carefully to make certain all items are included. Check off items on this sheet indicating completeness of your understanding.

General Departmental Policies and Procedures _____

Attendance Policies _____

C Clause _____

Grading Policies _____

Academic Dishonesty _____

General Laboratory Biosafety Procedures _____

Biosafety in Microbiology _____

Accident Procedures _____

Fire and Other Emergency Policies _____

Map of Fire Exits and Safety Equipment _____

Blood-borne Pathogens _____

Occupational Exposure to Hazardous Chemicals
in Laboratories _____

In case of laboratory accidents resulting in materials splashed in the eyes, your instructor must know that you wear contact lenses.

Do you wear contact lenses? Yes _____ No _____

I, the undersigned, agree to comply with all departmental policies and laboratory safety regulations set forth by the Marquette University Department of Medical Laboratory Science.

Name (print): _____

Signature: _____ Date: _____

Current standing (check one): _____ Freshman _____ Sophomore

_____ Junior/first-year certificate student