



Madonna University  
Biomedical Sciences  
Bloodborne Pathogens  
Exposure Control Plan

# MADONNA UNIVERSITY STUDENT LAB INFECTION CONTROL POLICY

## Introduction

Of continual concern to all health care workers (HCW) is the occupational risk of acquiring serious infection. A particular concern to the laboratory worker is blood-borne viral infections, which may be transmitted via percutaneous exposure or mucus membrane exposure. Since many patients with blood-borne infections are asymptomatic, strict adherence to the OSHA Standard Precautions policy is the best preventative measure against acquisition of occupationally acquired disease. Our policy of Universal/Standard Precautions emphasizes the need for health care workers to consider **all** patients as potentially infectious with blood-borne pathogens, and to adhere rigorously to infection control precautions aimed at minimizing exposure to blood and body fluids of **all** patients. To prevent spread of infection to students, visitors and staff.

## Principle

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## Personnel

1. Personnel shall be instructed in the requirements of Standard Precautions
2. Personnel shall be instructed in good hand washing technique. Hands shall be washed before and after patient specimen contact, prior to eating or drinking, upon glove removal, and whenever contaminated while handling patient specimens. Gloves must be worn for all routine phlebotomy and venous access procedures. Hand sanitizer may be used if hands are not visibly soiled.
3. Eating, drinking and application of cosmetics are not allowed in the laboratory area.
4. Food must be stored only in refrigerators designated for that purpose.
5. Personnel shall adhere to dress codes in effect in their area of assignment. Cover garments shall be removed when leaving the laboratory. DO NOT wear lab coats in common/public areas.
6. Students with draining skin lesions or other evidence of an infectious process shall report the condition to their instructor with possible referral to their personal physician for evaluation.

7. In the event a student is exposed to a communicable disease, he/she should report this promptly to the instructor. Follow-up shall be conducted with the student's personal physician.
  8. All new personnel shall be immune to rubella, rubeola and varicella.
  9. Hepatitis B vaccine is strongly recommended to all susceptible, at-risk, personnel.
  10. All TB skin test negative personnel shall have a PPD skin test at least annually, unless contraindicated.
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## **Specimen Handling**

1. Gloves shall be worn when handling blood, tissue specimens, blood soiled items, body fluids, excretions, as well as surfaces, materials and objects contaminated by them. Contact with phones, doorknobs, papers, etc., should be avoided while wearing gloves. Gloves shall also be worn for all routine phlebotomy. In those areas of the laboratory in which gloves are routinely worn, all telephones and computer keyboards must be considered contaminated.
2. Gowns or aprons and face protection shall be worn during procedures that are likely to generate splashes of blood or other body fluids, and should be removed prior to leaving the laboratory.
3. No mouth pipetting of specimens or reagents is allowed. Mechanical pipetting devices must be used for the manipulation of all liquids.
4. All specimens of blood and body fluids are to be put in a well-constructed container with Biohazard label and a secure lid to prevent leaking during transport.
5. All persons processing blood and body fluid specimens (e.g. removing tops from vacuum tubes) must wear gloves. Masks and protective eyewear must be worn if mucous-membrane contact with blood or body fluids is possible. Gloves must be changed and hands washed after completion of specimen handling.

6. Quality control products and biological reagents prepared from human or animal sources should be handled with the same precautions applied to patient specimens.
  7. Specimens should be transferred to analyzer cups or other tubes with transfer pipettes and not by pouring.
  8. Aspirating tubes for automatic sampling equipment should be wiped with tissues and not with fingertips.
  9. To prevent the dispersion of aerosols, Vacutainer stoppers should be removed with a twisting motion.
  10. All procedures and manipulation of infectious material should be performed in order to minimize the creations of droplets and aerosols. Biological safety cabinets (Class I or II) should be used whenever procedures are conducted that have a high potential for generating droplets. Procedures that have a high potential for creating aerosols or infectious droplets include centrifuging, blending, sonicating, vigorous mixing, and harvesting infected tissues. Centrifuge safety cups are recommended for centrifugation of blood or other body fluids. Centrifuge tops should not be opened until the rotor has fully stopped.
  11. 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.
  12. Scientific equipment that has been contaminated with blood or other body fluids must be decontaminated and cleaned before being repaired in the laboratory or transported to the manufacturer. Decontamination can be done using 10% Clorox or other hospital approved disinfectant. If this is not possible, the equipment must be tagged with a biohazard label and the location of contamination identified.
  13. All persons must wash their hands after completing laboratory work.
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# MADONNA UNIVERSITY PERSONAL PROTECTIVE MEASURES POLICY

## Policy

All personnel who enter a laboratory and engage in activities requiring protective measures are required to comply similarly. It is difficult, if not impossible, to maintain a “clean area” in a laboratory with different operations being carried out. Therefore, if contacting surfaces in a laboratory (e.g. phones keyboards, benchtops and doorknobs) without gloves, hands should be washed when leaving.

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## Recommendations

1. **Closed specimens:** Because of the unpredictable nature of blood drawing, the outside of a blood specimen is liable to be contaminated, even when blood is not visible.
  - a. If the skin on the hands is intact (no cuts, abrasions, chapping, etc.), gloves are not required since intact skin is an adequate barrier against exposure from this level of contamination. Hands should be washed after completing handling to avoid contaminating other sites.
  - b. If the skin on the hands is not intact, gloves must be worn when handling a specimen, whether open or closed. A Band-Aid is not an adequate barrier if the hands become wet or if the sample spills or breaks in the hands.
  - c. A specimen container which is visibly contaminated with blood or other body fluids should be cleaned with 10% bleach or other approved agents. This should be done at the time of collection or upon receipt in the laboratory.
2. **Bagged specimens** may be handled without gloves, face shields or gowns.
3. Specimens may be transported from lab to lab or within a laboratory without being bagged.
4. **Protective clothing and devices:**
  - a. All employees engaged in testing activities will wear fluid barrier gowns, or buttoned lab coats.

- b. Gowns must be impervious to fluids and no shorter than mid-thigh in length. Jackets which only cover down to the hips and aprons that do not protect the arms are unacceptable.
- c. When handling an open tube of blood or body fluid, appropriate protection includes gloves, a fluid barrier gown and splash shield which may be worn or fixed in position at the bench.
- d. Sealed units of donor blood or blood components do not require gloves, face shields or gowns when handling.
- e. Gloves and face shields are required when handling microbiological culture plates or tubes.
- f. Lab coats and fluid barrier gowns must be removed prior to leaving the laboratory area. No lab coats in common or public areas.
- g. Additional precautions appropriate to individual sections such as the use of biological safety cabinet, that have been defined by the Blood Borne Pathogen policy are not superseded by this policy and remain in effect.

# BIOHAZARDOUS WASTE

At Madonna University the term **biohazardous waste** is used to describe different types of waste that might include infectious agents. Generally speaking, infectious agents are classified in four risk groups with risk group 1 being of no or very low risk and risk group 4 being of high risk to the individual and the community. With the exception of risk group 4, all others are used at Madonna University (predominantly risk group 1,2 and 3 agents).

To provide for a safe work environment, all infectious agents need to be handled at a certain containment or biosafety level depending on: virulence, pathogenicity, and stability, route of spread, communicability, operation, quantity, and availability of vaccines or treatment. The applicable biosafety level not only defines the general handling procedures, but also the treatment of biohazardous waste. Under normal circumstances, a risk group 2 agent requires biosafety level 2 containment and biohazardous waste procedures. Nevertheless, if a risk group 2 agent is grown in mass quantities, biosafety level 3 containment is necessary.

Please refer to the most recent editions of the CDC/NIH Biosafety in Microbiological and Biomedical Laboratories or the NIH Guidelines for Research Involving Recombinant DNA, for a comprehensive discussion on this matter.

Currently, the following waste categories are considered to be biohazardous waste.

- **Medical waste**, which means any solid waste which is generated in the diagnosis, treatment (e.g., provision of medical services), or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals, as well as all categories defined by the Michigan Medical Waste Regulatory Act (MMWRA).
- **Regulated waste** as defined by the Michigan Occupational Safety and Health Act (MIOSHA) on Bloodborne Infectious Diseases.
- **Laboratory waste and regulated waste** as defined in the “Guidelines for Research Involving Recombinant DNA Molecules” (NIH) and the CDC/NIH “Guidelines on Biosafety in Microbiological and Biomedical Laboratories.”

According to the MMWRA, Medical Waste includes:

- a) Cultures and stocks of infectious agents and associated biologicals, including laboratory waste, biological production wastes, discarded live and attenuated vaccines, culture dishes, and related devices;
- b) Liquid human and animal waste, including blood, blood products, and body fluids, but not including urine or materials stained with blood or body fluids;
- c) Pathological waste, which means human organs, tissues, body parts other than teeth, products of conception, and fluids removed by trauma or during surgery or autopsy or other medical procedure, and not fixed in formaldehyde;
- d) Sharps, which means needles, syringes, scalpels, and intravenous tubing with needles attached, independent of whether they are contaminated or not;

- e) Contaminated wastes from animals that have been exposed to agents infectious to humans, these being primarily research animals;

In addition, the MIOSHA Bloodborne Pathogen Standard regulates the following waste:

- liquid or semi-liquid blood or other potentially infectious materials;
- contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed;
- items that are caked with dried blood or other potentially infectious materials and are capable of releasing these materials during handling;
- contaminated sharps which includes any contaminated object that can penetrate;
- pathological and microbiological wastes containing blood or other potentially infectious materials.

The CDC/NIH Biosafety Guidelines cover contaminated waste that is potentially infectious or hazardous for humans and animals. The same is true for the NIH Guidelines on recombinant DNA which also includes contaminated waste potentially infectious or hazardous for plants.

### **General Labeling, Packaging and Disposal Procedures**

Currently, biohazardous waste is to be decontaminated before leaving Madonna University. Most of the waste generated by the MLS program will be incinerated. The responsibility for decontamination and proper disposal of biohazardous waste lies with the producing facility (e.g., laboratory and department).

All biohazardous waste needs to be packaged, contained and located in a way that protects and prevents the waste from release at any time at the producing facility prior to ultimate disposal. If storage is necessary, putrefaction and the release of infectious agents in the air must be prevented. **No biohazardous waste cannot be stored for more than 90 days on site.**

If not stated otherwise (see below), most **general biology class laboratory** biohazardous waste will be disposed of in biohazard bags. Currently, Madonna University requires the use of red biohazard bags that include the biohazard symbol and a built-in heat indicator with the word ("AUTOCLAVED"). All waste disposed of in these bags is to be autoclaved until the waste is decontaminated. The built-in heat indicator will turn dark. All autoclaves used for the decontamination of biohazardous waste will be tested on an annual basis. After successful autoclaving (decontamination), all biohazard bags need to be placed in opaque (black) plastic non-biohazard bags that are leak-proof. These opaque bags can be picked up by custodial services. Biohazardous waste that is decontaminated is no longer considered hazardous and the biohazard symbol needs to be removed or the waste labeled as decontaminated (e.g., "AUTOCLAVED" Heat Indicator).



## WASTE PROCEDURES FOR BIOSAFETY LEVEL 1 AND 2

### Cultures, Stocks and Related Materials

Cultures and stocks of **infectious agents** and associated biologicals (as previously defined), shall be placed in biohazard bags. Double or triple bagging may be required to avoid rupture or puncture of the bags. All waste must be placed inside puncture resistant, leak proof containers for medical waste disposal pickup, by a licensed, insured and bonded company as per the State of Michigan.

### Bulk Liquid Waste, Blood and Blood Products

All liquid biohazardous waste from humans or animals such as blood, blood products, and certain body fluids can be disposed of directly by flushing down a **sanitary sewer**. All other liquid biohazardous waste needs to be autoclaved prior to disposal.

### Sharps

Sharps must be placed in a rigid, puncture resistant, closable, and leak-proof container that is labeled with the word "**Sharps**" and the biohazard symbol. Food containers (e.g., empty coffee cans) are **not permissible** as sharps containers. Sharps must be handled with extreme caution. The clipping, breaking and recapping of needles is highly discouraged and dangerous. Sharps containers should not be filled more than 2/3 full. Filled sharps containers must be closed securely (use the attached lid) and labeled with a Madonna University materials pick-up tag. Do not store used and closed sharps containers for more than 90 days. **Never place any type of sharps in the general waste collection.**

### Contaminated Solid Waste

Contaminated solid waste includes cloth, plastic and paper items that have been exposed to agents that are infectious or hazardous to humans, animals, or plants. These contaminated items shall be placed in biohazard bags and decontaminated by autoclaving. Double or triple bagging may be required to avoid rupture or puncture of the bags. **Contaminated Pasteur pipettes are considered sharps** and need to be disposed of in a sharps container.

## WASTE SPECIFIC PROCEDURES FOR BIOSAFETY LEVEL 3

Biohazardous waste including risk group 2 and 3 agents that are handled at Biosafety Level 3 is to be autoclaved at the point of origin (laboratory, or facility). In addition, this waste may be incinerated. Transportation of un-autoclaved waste outside of the building is not permitted except for personnel from a licensed medical waste disposal company.