

Biohazardous Waste Management at MSU

This educational brochure is designed to assist you with the proper handling and disposal of biohazardous/medical waste. Additionally, it functions as a tool used to meet the biohazardous waste training requirements of the Michigan Medical Waste Regulatory Act (MMWRA). Once you have read the brochure, complete the site-specific training record as outlined in the training form included in the brochure. Please note that the information provided in this brochure relates to general biohazardous waste handling procedures to be followed in the MSU lab environment and may not apply to every work environment. Additional training or assistance may be required for certain clinical, farm or diagnostic environments. For further assistance, contact the ORCBS Biosafety Team at (517) 355-0153.

What is biohazardous waste?

At Michigan State University, the terms *biohazardous* or *medical waste* is used to describe different types of waste that might include blood, tissues, infectious agents, toxins, or recombinant DNA materials. What exactly is and is not included depends on the regulations, guidelines and policies covering this type of waste. For that reason, MSU has developed a comprehensive *Biohazardous Waste Management Plan* that is available to you upon request and can also be found on our website (<http://www.orcbs.msu.edu>).

Under the Michigan Medical Waste Regulatory Act (MMWRA), the following categories of items are regulated as medical waste. Thus, they are managed as biohazardous waste at MSU:

1. Cultures and stocks of infectious agents and associated biologicals, including laboratory waste, discarded live and attenuated vaccines, culture dishes, and related devices;
2. Liquid human and animal waste, including blood and blood products and body fluids but not including urine or materials stained with blood or body fluids;
3. 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 chemically-fixed (i.e. formaldehyde);
4. Sharps, which means needles, syringes, scalpels, and intravenous tubing with needles attached;
5. Contaminated wastes from animals that have been exposed to agents infectious to humans, these being primarily research animals.

The Michigan Occupational Safety and Health Administration (MIOSHA) "Bloodborne Infectious Diseases" standard requires that the following items are managed as biohazardous waste:

1. Liquid or semi-liquid human blood or other potentially infectious materials;
2. Contaminated items that would release human blood or other potentially infectious materials in a liquid or semi-liquid state if compressed;
3. Items that are caked with dried human blood or other potentially infectious materials and are capable of releasing these materials during handling;
4. Contaminated sharps, which includes any contaminated object that can penetrate the skin;
5. Pathological and microbiological wastes containing human blood or other potentially infectious materials.

Biohazardous waste also includes laboratory waste and other biological research waste if it is covered by the *NIH Guidelines for Research Involving Recombinant DNA Molecules* and/or the *CDC/NIH Biosafety in Microbiological and Biomedical Laboratories* guidelines. Both of these publications are available at the ORCBS website (<http://www.orcbs.msu.edu>), or contact the Biosafety Team at (517) 355-0153.

Responsibilities

Everyone who produces, handles, treats, and/or disposes of biohazardous waste is responsible for the proper management of these materials. By assuming these responsibilities, regulatory compliance can be assured, and exposure risk for MSU employees and the community is greatly reduced.

Supervisors

It is the responsibility of supervisory personnel to assure that all employees who generate, handle, treat, and/or dispose of biohazardous waste receive biohazardous waste training and follow the procedures outlined in the *Biohazardous Waste Management Plan*. Training is offered in a variety of ways, including the use of this brochure. Training is also included in the following ORCBS courses: Biosafety Training, Biosafety Basics for Animal Users and Bloodborne Pathogen Training. Supervisors should contact the ORCBS for more information regarding training options.

Employees

If you generate, handle, treat, and/or dispose of biohazardous waste you are responsible for completing biohazardous waste training as outlined in the "training record" section of this brochure and for following the procedures and practices outlined in the *Biohazardous Waste Management Plan*. It is important to contact your supervisor or the ORCBS Biosafety Team if you have questions regarding the handling and disposal of your biohazardous wastes.

Waste Types: Treatment, Storage and Disposal

Sharps

Sharps include all syringes and needles, scalpels, and intravenous tubing with needles attached. Also, any item that is sharp enough to penetrate the skin and is contaminated with potentially infectious materials or recombinant DNA (e.g., contaminated capillary tubes, Pasteur pipettes, and microscope slides and cover slips) is defined as a sharp. Additionally, the Medical Waste Division of the Michigan Environmental Protection Agency recommends placing used vaccine vials in a sharps container due to the potential for breakage and possible exposure.

Disposable sharps must be placed into an approved MSU sharps container immediately following use to reduce puncture risk. An approved sharps container is one that is leakproof, puncture-resistant, closable, and bears the biohazard symbol. Approved sharps containers are available for purchase through MSU University Stores or MSU Biochemistry Stores.

A sharps container must be permanently closed and disposed of through the ORCBS:

- When it is $\frac{3}{4}$ full, or
- Within 90 days of the date that the first sharp was placed in it, whichever comes first.

Numerous sizes and styles of sharps containers are available. Please use the container that best fits your needs. If you only generate a very small number of sharps over a 90 day period then it is recommended that you purchase a small container.

To facilitate timely and proper disposal, sharps containers used on campus should also be labeled with the ORCBS "SHARPS" label. These are available at no cost through the ORCBS, Biochemistry and University stores. For pick-up request information, refer to the MSU Waste Disposal Guide (<http://www.orcbs.msu.edu>).

Solid Non-Sharps Biohazardous Waste

Wastes in this category include non-sharps items such as cultures and stocks of infectious agents and associated biologicals, laboratory waste (i.e. biologically-contaminated gloves, paper towels, plastic pipette tips), biological production wastes, discarded live and attenuated vaccines, culture dishes, and related materials.

These wastes must be stored in biohazard bags prior to decontamination. While in use for waste storage, biohazard bags must be secured in a manner that will eliminate spillage. If a bag is used primarily for disposal of items that are not likely to release liquids (i.e. pipette tips, Kim Wipes, etc.), a wire bag rack or a rigid container is an acceptable minimal means of securing the bag to eliminate spillage. If the bag is used for storage of items that are likely to release liquids and possibly result in leakage, the bag should be stored in a leak-proof secondary container (i.e. trash can with biohazard label) with a lid.

Solid non-sharps biohazardous waste must be autoclaved by the laboratory generating the waste unless other arrangements have been made with the ORCBS. Biohazard bags approved for this purpose are autoclavable, bear the biohazard label, and have a built-in "heat indicator" to allow for verification of autoclave treatment. Approved bags are available through MSU University Stores or MSU Biochemistry Stores.

When transporting waste bags to the autoclave for treatment, secure the bags closed with a rubber band, twist tie or other closure device which can be easily removed and place the bags in a secondary container (i.e. a pan or bucket) to prevent leakage. Use a cart if possible.

When treating solid biohazardous waste for disposal, use an autoclave that has been tested and approved by the ORCBS for biohazardous waste decontamination. These autoclaves have a large colored sign posted on or near the autoclave that outlines the minimum time and cycle requirements for effective waste decontamination. (Remember: Leave the bag open, add 1 cup of water, and use the appropriate autoclave cycle time for effective waste treatment!)

Once treated by autoclave, allow the waste to cool to room temperature. Then, place the bag inside a non-transparent plastic bag or other secondary non-transparent container (i.e. closed box) prior to disposal as trash.

If biohazardous waste is generated on or off campus and needs to be transported by vehicle, please contact the ORCBS for assistance. Do not transport such waste without first consulting the ORCBS!

Liquid Biohazardous Waste

Human or animal blood and body fluids can be flushed to the sanitary sewer without prior treatment. However, chemical disinfection is recommended prior to disposal if feasible. All other potentially infectious liquids (i.e. media with growth, cell line waste, etc.) must be autoclaved or chemically disinfected before disposal in the sanitary sewer. Do not autoclave wastes that are chemically treated as this action may create a chemical exposure hazard.

If using a chemical disinfectant, follow the manufacturer's label instructions regarding concentration, and contact time. Also, note that disinfectants are hazardous materials that may require the use of additional personal protective equipment to control chemical exposure. Refer to your product's material safety data sheet for further information or contact the ORCBS for assistance.

Animal Carcasses

Carcasses and body parts from animals used in infectious disease or recombinant DNA research must be collected in biohazard bags (size permitting) for disposal. These materials can then be incinerated. Animal carcasses and body parts are picked up by ULAR (3-5063). For further information, refer to the MSU Waste Disposal Guide which is available on the ORCBS website.

Exposure Control

Proper segregation, storage, treatment and disposal of biohazardous waste is essential not only to comply with waste regulations, but more importantly to reduce your risk of exposure to potentially infectious materials. An exposure occurs when potentially infectious materials are permitted to enter your bloodstream through a break in the skin or contact with your eyes, nose or mouth. Examples of exposures related to biohazardous waste handling include incidents such as:

- Splashing liquid biological waste into your eye during pour-off for disposal
- Puncturing your skin with a biologically-contaminated needle
- Spilling liquids from a ruptured biohazardous waste bag onto broken, unprotected skin

In the event of an exposure to potentially infectious materials, take the following actions:

1. Wash the exposed skin or flush the mucous membranes for 10-15 minutes.
2. Notify your supervisor.
3. Report to Olin Urgent Care (355-0219) during normal working hours or for after hour or weekend exposures report to Sparrow Emergency Room (364-4120) for medical follow-up.

Please remember to fill out the enclosed Biohazardous Waste Training Record and return it to the ORCBS.

BIOHAZARDOUS WASTE TRAINING RECORD

Please print clearly and complete ALL information fields. Return completed training record to the ORCBS.

Employees:

In accordance with the Michigan Medical Waste Regulatory Act, all MSU employees who handle biohazardous waste must be trained in the proper segregation, storage, treatment and disposal of such waste. To comply with these training requirements, you must:

1. Review the general information provided in this brochure, and
2. Complete site-specific training with your supervisor or lab manager as outlined below.

Supervisors:

It is your responsibility to assure that employees have received training regarding proper segregation, storage, treatment and disposal of biohazardous waste, and that employees comply with the practices outlined in this document and the Biohazardous Waste Management Plan. To assist you in this task, please review the following site-specific information with affected employees, checking each item as it is reviewed. Once training is completed, fill out the information at the bottom of this form with the employee. Please make a copy of the completed form for your files and return the original to: **ORCBS Biosafety, C-124 Engineering Research Complex.**

Site-Specific Practices

- _____ Discussion and clarification of which wastes generated in the work area are biohazardous and how those items are to be segregated, stored, transported, treated and disposed of
- _____ Review of procedures for on-site waste treatment methods (i.e. proper use of autoclave for waste decontamination purposes)
- _____ Review of hazardous waste labeling and Pick-Up procedures as they apply to the work area (refer to the MSU Waste Disposal Guide and Biohazardous Waste Management Plan)

Employee Name: _____ Date of Training: _____

Supervisor's Name: _____ Date of Birth: _____

Department: _____

VERIFICATION OF TRAINING

I certify that the information in the ORCBS biohazardous waste brochure has been reviewed. In addition, site-specific training items were reviewed and understood as required by the MSU Biohazardous Waste Management Plan.

Supervisor/Trainer Signature - Date

Employee Signature - Date