

**APPENDIX D**  
**INFECTIOUS WASTE MANAGEMENT GUIDE**

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## **I. INTRODUCTION:**

On May 1, 1990, the Ohio Environmental Protection Agency (OEPA) amended Chapter 3745 of the Ohio Administrative Code (OAC). These and subsequent amendments regulate the generation, management, and disposal of infectious waste.

For Wright State University (WSU) to comply with these regulations, individual generators of infectious waste at WSU and WSU affiliated facilities will have to follow the procedures outlined in this guide as a means of managing their infectious waste. This guide should be reviewed periodically by all personnel responsible for areas where infectious waste is generated. The guide MUST also be distributed to, and reviewed by, all personnel working in areas where infectious waste is generated. The guide will be updated as the OEPA revises the regulations or as WSU changes procedures.

The following appendices are included at the end of this guide to assist the individual generators of infectious waste:

Appendix I - OEPA Definition of Infectious Waste

Appendix II - WSU Infectious Waste Spill Containment and Cleanup Procedures

## **II. SUMMARY OF REGULATIONS:**

In addition to defining infectious waste, the amendments of OAC Chapter 3745 also provide specific packaging, handling, treatment and transportation requirements, as well as procedures for infectious waste spill containment and cleanup.

### **A. What is Infectious Waste?**

Infectious waste is waste resulting from the work with infectious or zoonotic agents. OEPA's definition of infectious waste, infectious agent, and zoonotic agent can be found in Appendix I of this guide.

### **B. Infectious Waste Packaging and Handling Requirements:**

All individual generators of infectious waste must segregate infectious waste from other waste at the point of generation. Infectious waste, other than sharps (i.e., hypodermic needles, syringes, scalpel blades, and glass articles that have been broken) or liquids, shall be accumulated in red or other colored plastic bags labeled with the international biohazard symbol. Bags containing infectious waste that are being transported off the premises where generated shall be placed inside a second sealed bag or fully enclosed, rigid, sturdy container. All sharp infectious waste shall be accumulated only in containers specifically designed and

manufactured for the management and/or disposal of “sharps” and be labeled with the international biohazard symbol and with the word “SHARPS”. All unused or non-infectious discarded hypodermic needles, syringes, scalpel blades, and glass articles that have been broken shall be accumulated in rigid, puncture resistant, leak resistant containers closed tightly to prevent loss of content and be labeled as “SHARPS”. Containers consisting solely of unused or non-infectious sharps are not required to be labeled with the international biohazard symbol. Liquid or semiliquid infectious waste consisting of blood, blood products, body fluids, and excreta shall be disposed of as described in paragraph C below. Liquid infectious cultures can be chemically treated and disposed of as described in Section III, A.3 on page 6. No infectious waste shall be compacted or ground when packaged.

All packaged infectious waste shall be stored in a manner that maintains the integrity of the packaging using refrigeration or freezing when necessary. All storage areas must be limited to authorized personnel or labeled as an infectious waste storage area.

C. Infectious Waste Treatment Requirements:

All infectious waste must be treated prior to disposal. Treatment can be performed on the premises where the infectious waste is generated or the infectious waste can be shipped off-site to a permitted infectious waste treatment facility. Wherever the infectious waste is treated, it must be treated by methods approved by the OEPA.

OEPA approved methods for the treatment of infectious waste includes incineration, autoclaving, chemical treatment with sodium hypochlorite solution (used for cultures only) and other methods specifically approved by the OEPA. In order to comply with the infectious waste treatment regulations, a treatment facility must meet operational and quality control requirements. For incineration and autoclaving, this includes, but is not limited to:

- Specific design criteria
- Temperature and residence time requirements
- Temperature and pressure (for autoclaving) monitoring
- Treatment area drainage requirements
- Scheduled calibration and testing
- Loading requirements
- Personnel training
- Documentation and records retention requirements
- Contingency plans for alternate treatment

Chemical treatment utilizing sodium hypochlorite (bleach) is a method approved for the treatment of cultures only.

Individual generators, who generate liquid or semiliquid infectious waste consisting of blood, blood products, body fluids, and excreta may discharge this material to a properly licensed sanitary sewer without prior treatment. This is the only type of infectious waste that can be disposed of without first treating it to render it non-infectious. All other infectious waste must be properly treated before being subjected to the general waste stream as ordinary solid waste.

D. Infectious Waste Transportation Requirements:

All infectious waste, even after it has been treated, which is transported off-site for treatment or disposal must comply with the transportation and shipping paper requirements of OAC Chapter 3745. For transporters who transport untreated infectious waste, these regulations include requirements for registration, labeling, packaging, vehicle design, refrigeration, holding time, disinfecting, spill containment, and cleanup. However, transporters need only comply with the shipping paper requirements if transporting treated infectious waste.

Generators of infectious waste must also comply with shipping paper requirements. There are two different types of shipping papers. The generator must assure that one of the two types accompanies every shipment of infectious waste that is transported off the generator's premises. The OEPA has designed treatment shipping papers which must accompany shipments of infectious waste to an off-site treatment facility and disposal shipping papers which must accompany treated infectious waste to an off-site disposal facility (i.e., landfill). Both shipping papers consist of multi-copy carbonless paper that is designed to track the waste from "cradle-to-grave" and assure the generator that the waste has reached its intended destination.

E. Infectious Waste Spill Cleanup and Containment Requirements:

If a spill or accidental release of infectious waste occurs during the process of generating, packaging, handling, treating or transporting infectious waste, the person responsible for the spill/release must comply with spill cleanup, containment, and reporting requirements. These requirements differ slightly for generators, transporters, and treatment facilities.

Generators must develop and implement a written spill containment and cleanup procedure that must be readily available to all persons likely to handle infectious waste.

Transporters must also develop and implement a spill cleanup and containment plan, as well as train all employees in the implementation of the plan.

Transporters must also carry spill containment and cleanup kits consisting of specific cleanup material.

Infectious waste treatment facilities and generators who treat their own waste by incineration or autoclaving must develop and implement a written spill cleanup and containment plan and provide training to all individuals who handle infectious waste. A spill cleanup and containment kit consisting of specific cleanup material must be kept in the vicinity of any storage, loading, unloading, decontamination, and treatment areas.

**THIS SUMMARY IS INTENDED AS AN OVERVIEW OF THE INFECTIOUS WASTE REQUIREMENTS. THESE REGULATIONS APPLY TO GENERATORS OF FIFTY POUNDS OR MORE OF INFECTIOUS WASTE PER MONTH. GENERATORS OF LESS THAN FIFTY POUNDS PER MONTH ARE SUBJECT TO LESS STRINGENT REQUIREMENTS. TO OBTAIN A SET OF THE INFECTIOUS WASTE REGULATIONS, CONTACT THE DEPARTMENT OF ENVIRONMENTAL HEALTH AND SAFETY AT EXT. 3118 OR THE OEPA AT (614) 644-2621.**

### **III. WRIGHT STATE UNIVERSITY INFECTIOUS WASTE STRATEGY:**

The regulations implemented by the OEPA governing the generation, management, and disposal of infectious waste create an impact on how WSU research, teaching, and health professionals handle waste contaminated or potentially contaminated with infectious agents. Depending on the time of year, WSU and WSU affiliated facilities generate between 300 and 900 pounds of infectious waste per month. This makes WSU a large quantity generator and subjects the university to the regulations for large quantity generators, as summarized in Section II of this guide.

As a result of the regulation, a decision was made to transport WSU's infectious waste off-site for treatment and disposal as opposed to treatment of infectious waste on-site (other than chemical treatment of cultures). This decision leaves WSU with the task of complying with the infectious waste generator requirements only, instead of both generator and treatment facility requirements. The University Task Force on Toxins and Infectious Material made the decision based on the costs and man-hours required to comply with treatment facility requirements (i.e., autoclave room renovation, calibration and testing, employee training, paperwork, etc.) versus the cost to transport and treat infectious waste off-site.

As a result of this decision, WSU individual generators of infectious waste are not permitted to autoclave or incinerate infectious waste and have it disposed of as ordinary trash. Autoclaves can be used for disinfection and sterilization purposes (i.e., for glassware, equipment) and for the treatment of waste not meeting the OEPA definition of infectious waste. Waste that does not meet the OEPA definition of infectious waste but requires autoclave treatment by another agency (i.e., National Institute of Health) shall be autoclaved in bags not labeled with the international biohazard symbol. Infectious waste will be accumulated in appropriate packages (supplied by the infectious waste contractor) which will be picked up by Environmental Health and Safety personnel for eventual transport off-site and treatment at a licensed facility prior to disposal.

Although infectious waste is not permitted to be treated via autoclaving or incineration and disposed as ordinary solid waste at WSU, on-site chemical treatment of infectious waste cultures (in liquid form only) using bleach is permitted. Also, untreated liquid or semiliquid infectious waste consisting of blood, blood products, body fluids, and excreta may be disposed of into the sanitary sewer system without prior treatment.

A. Procedures for WSU Infectious Waste Generators:

WSU personnel who generate infectious waste shall follow the following steps.

1. All WSU personnel who generate infectious waste must notify the Department of Environmental Health and Safety (EHS). To determine if you generate infectious waste, refer to the infectious waste definitions in Appendix I of this guide. Any infectious waste meeting the definition of hazardous waste due to its chemical properties or which is also radioactive must be managed differently than regular infectious waste. **Any WSU personnel who generates chemically hazardous or radioactive infectious waste must contact EHS to determine proper treatment and disposal procedures.**
2. As a generator, you shall segregate infectious waste from other waste at the point of generation.
3. If you generate cultures (in liquid form), which when intended for disposal meet the definition of infectious waste, you can treat the cultures using approved chemical treatment procedures. The approved chemical treatment procedures are as follows:
  - a. Only cultures in liquid form can be chemically treated;
  - b. The approved chemical treatment solution shall contain, volume per volume, at least fifteen percent sodium hypochlorite (household grade bleach). The solution shall be at least fifteen percent bleach not fifteen percent sodium hypochlorite which is the active ingredient in bleach;
  - c. All cultures shall be submerged or otherwise in complete contact with the chemical treatment solution for a minimum of twenty minutes;
  - d. Cultures of infectious agents that are recommended by the Centers for Disease Control to be handled in accordance with biosafety level 3 or 4 practices shall not be treated by these chemical treatment procedures;
  - e. The chemical treatment solution shall be mixed immediately prior to use and discarded after use; and

- f. All waste cultures, which have been chemically treated, can be released to the sanitary sewer.
4. Untreated liquid or semiliquid infectious waste consisting of blood, blood products, body fluids, and excreta, may be disposed into the sanitary sewer system without prior treatment.
5. If you generate infectious waste other than liquid or semiliquid waste consisting of blood, blood products, body fluids, excreta, or liquid cultures, EHS will supply you with a box to accumulate your infectious waste. The individual generator must supply containers for accumulating “sharps” waste (i.e., hypodermic needles and syringes, scalpel blades, used or unused, and infectious waste glass articles that have broken).
6. All "sharps" infectious waste must be accumulated in approved containers and must be labeled with the international biohazard symbol or the words “Infectious Waste” and with the words “SHARPS”. Refer to Appendix III Wright State University Sharps Management Policy to determine the proper method for managing sharps waste.
7. All infectious waste, other than liquid waste, must be accumulated in boxes supplied by EHS. These boxes are supplied by the infectious waste disposal contractor and meet all specifications as required by the Ohio EPA. No other containers shall be used unless first approved by EHS. When using the boxes supplied by EHS, the following restrictions apply:
  - a. All waste must be bagged or properly containerized before being placed in a box.
  - b. No freestanding liquid shall be poured into a box and no containers of liquid shall be placed in a box without prior approval from EHS.
  - c. Absolutely no chemically hazardous or radioactive waste, regardless of its infectious nature, shall be disposed of in a box.
  - d. Do not fill a box greater than its maximum weight capacity. The maximum capacity of the large box is 50 lbs. and the small box is 30 lbs.
  - e. A full box must have its interior liner bag taped closed and the box properly sealed before it can be picked up.

8. Once a container of infectious waste becomes full, contact EHS at ext. 3118 or 3788, to schedule a pickup. EHS will supply you with a new box. If you generate an infectious waste, which you cannot keep in a nonputrescent state prior to a box becoming full, notify EHS and immediate arrangements for a pickup will be made.
9. All labs and rooms that are accumulating infectious waste must be labeled with the international biohazard symbol at all points of access. These labels will be supplied by EHS.
10. In the event of an accidental spill or release of infectious waste, the person or persons responsible for the spill must instigate containment and cleanup. The WSU Infectious Waste Spill Containment and Cleanup Procedure will be followed. These procedures are provided in Appendix II of this guide. These procedures must be readily available to all personnel involved with the generation and/or handling of infectious waste. All personnel must periodically review and become familiar with the Spill Containment and Cleanup Procedure.

**All personnel who generate infectious waste shall follow these steps. By following these procedures Wright State University can maintain compliance in a systematic manner with the Ohio EPA infectious waste regulations. All personnel involved in the generation of infectious waste shall become familiar with the procedures set forth in this guide. If anyone has ideas that may enhance WSU's ability to comply with these regulations, please contact EHS. Input from people who are directly regulated makes compliance much easier and procedures more effective. For any questions, concerns, or input, the Department of Environmental Health and Safety can be reached at ext. 3118.**

**APPENDIX I**  
**OHIO ENVIRONMENTAL PROTECTION AGENCY**  
**DEFINITIONS OF INFECTIOUS WASTE**

- A. “Infectious Agents” means a type of microorganism, helminth, or virus that causes, or significantly contributes to the cause of increased morbidity or mortality of human beings.
- B. “Zoonotic Agent” means a type of microorganism, helminth, or virus that causes disease in vertebrate animals and that is transmissible to human beings and causes or significantly contributes to the cause of increased morbidity or mortality of human beings.
- C. “Infectious Wastes” includes all of the following substances or categories of substances:
1. Cultures and stocks of infectious agents and associated biologicals, including, without limitation, specimen cultures, cultures and stocks of infectious agents, wastes from production of biologicals, and discarded live and attenuated vaccines;
  2. Laboratory wastes that were, or are likely to have been, in contact with infectious agents that may present a substantial threat to public health if improperly managed;
  3. Pathological wastes, including, without limitation, human and animal tissues, organs, and body parts, and body fluids and excreta that are contaminated with or are likely to be contaminated with infectious agents, removed or obtained during surgery or autopsy or for diagnostic evaluation, provided that, with regard to pathological wastes from animals, the animals have or are likely to have been exposed to a zoonotic or infectious agent
  4. Waste materials from the rooms of humans, or the enclosures of animals, that have been isolated because of diagnosed communicable disease that are likely to transmit infectious agents. Also included are waste materials from rooms of patients who have been placed on blood and body fluid precautions under the universal precaution system established by the "Center for Disease Control" in the Public Health Service of the United States Department of Health and Human Services, if specific wastes generated under the universal precautions system have been identified as infectious wastes by rules referred to in section C.8. of this appendix;
  5. Human and animal blood specimens and blood products that are being disposed of, provided that with regard to blood specimens and blood products from animals, the animals were or are likely to have been exposed to a zoonotic or

infectious agent. "Blood products" does not include patient care waste such as bandages or disposable gowns that are lightly soiled with blood or other body fluids, unless such wastes are soiled to the extent that the generator of the waste determines that they should be managed as infectious wastes;

6. Contaminated carcasses, body parts, and bedding of animals that were intentionally exposed to infectious agents from zoonotic or human diseases during research, production of biologicals, or testing of pharmaceuticals, and carcasses and bedding of animals otherwise infected by zoonotic or infectious agents that may present a substantial threat to public health if improperly managed;
7. Sharp wastes used in the treatment, diagnosis, or inoculation of human beings or animals or that have, or are likely to have, come in contact with infectious agents in medical, research, or industrial laboratories, including, without limitation, hypodermic needles and syringes, scalpel blades, and glass articles that have been broken. Such wastes are hereinafter in this rule referred to as "sharp infectious waste" or "sharps";
8. Any other waste materials generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals, that the Public Health Council created in Section 3701.33 of the Ohio Revised Code (ORC), by rules adopted in accordance with Chapter 119 of the ORC, identifies as infectious wastes after determining that the wastes present a substantial threat to human health when improperly managed because they are contaminated with, or are likely to be contaminated with, infectious agents;
9. Any other waste materials the generator designates as infectious wastes.



### C. INFECTIOUS WASTE SPILL CONTAINMENT AND CLEANUP PROCEDURES:

In the event of an accidental spill or release of infectious waste at Wright State University or at a Wright State University affiliated facility, the following procedures must be implemented by the personnel responsible for the spill.

1. Immediately following the spill/release, secure the area so only authorized personnel may enter. Remove and containerize any contaminated garments immediately. Contact one of the primary contacts on the first page of this plan. At that time a determination will be made as to what, if any, outside agencies or support groups shall be contacted. If the spill/release occurs after 5:00 p.m. or on a Saturday, Sunday or holiday, contact Public Safety, ext. 2111. Public Safety will contact appropriate Environmental Health and Safety personnel.
2. Go to the nearest spill containment and cleanup kit and obtain all necessary containment, cleanup and protective equipment needed to effectively handle the spill/release involved. The location of the spill containment and cleanup kits are located on the first page of this plan.
3. Further secure the area to authorized personnel if needed.
4. Each person involved in the cleanup shall wear protective equipment as needed. This equipment is to be worn during the entire spill cleanup operation.
5. Wait 30 minutes before reentering the spill area to allow for settling of aerosols.
6. Spray spill area with disinfectant spray from the spill containment and cleanup kit or use a bleach solution (minimum 15% bleach to water) if the spill is large. Begin at the perimeter of the spill and work inward. Allow the disinfectant to remain in contact with the spilled material for at least twenty minutes before proceeding.
7. Use the absorbent pads supplied from the spill containment and cleanup kit to absorb any freestanding liquid.
8. Place all used absorbent pads and other waste generated during the cleanup into a biohazard bag supplied from the spill containment and cleanup kit. Absolutely no freestanding liquid or containers of liquid shall be put in any biohazard bag. All freestanding liquid shall be absorbed prior to placing it in the biohazard bag.
9. Use the chemical disinfectant supplied from the spill containment and cleanup kit to disinfect the entire area again. Clean up the area as deemed appropriate (i.e., use of absorbent pads). Any absorbent pads used during the disinfection of the area shall be considered infectious waste and placed in the biohazard bags.

10. Clean and disinfect all non-disposable items using the disinfectant supplied from the spill containment and cleanup kit.
11. Remove protective equipment and manage disposable items as infectious waste (place in biohazard bags).
12. Immediately following spill/release cleanup, all infectious waste generated from cleanup operations must be stored and managed as specified in Wright State University's "Infectious Waste Management Guide."
13. Notify Environmental Health and Safety, ext 2215, if material from a spill containment and cleanup kit was used to respond to the spill.

## **APPENDIX III**

### **WRIGHT STATE UNIVERSITY SHARPS MANAGEMENT POLICY**

As a university that generates infectious waste, individuals on campus must be aware of recent interpretations made by the EPA during inspections at WSU regarding the management of sharps. The following procedures must be followed as interpreted by the EPA per the requirements of Ohio Administrative Code 3745-27-34(B).

The EPA considers needles, razor/scalpel blades, lancets, broken glassware, pipettes, pipette tips, and syringes (even without needles) to be sharps. All of these sharps must be accumulated for disposal immediately into an approved sharps container. The type of container required depends on the type of sharps and whether or not the sharps are considered infectious. The EPA separates sharps into two categories. These are:

**Maximum puncture potential sharps** – These included needles, razor/scalpel blades, lancets, and any other sharp deemed to pose a definite puncture potential.

**Minimum puncture potential sharps** – These include pipettes, pipette tips, syringes without needles, and large broken glassware

Identify the type of sharps you generate and determine if they are infectious. Refer to Appendix I of the Infectious Waste Management Guide to review the definition of infectious waste. Once you have identified the type of sharp you generate and determined its infectious nature refer to the category below and manage your sharps accordingly.

#### Maximum Puncture Potential Sharps that **are** Infectious:

An approved sharps container is a puncture and leak resistant container specifically designed and manufactured for the accumulation of sharps and labeled with the words “Infectious Waste” or with the international biohazard symbol (i.e. a red sharps container). This type of sharps container, when full, shall be put in an infectious waste box supplied by EHS that also must be marked as containing sharps and will be managed by EHS.

#### Maximum Puncture Potential Sharps that **are not** Infectious:

An approved sharps container is a puncture and leak resistant container that can be specifically designed and manufactured for the accumulation of sharps or could be a can or plastic container with a secure fitting lid that can be closed when full. In any case, these containers **must not** be labeled with the biohazard label or any other marking that would indicate it is infectious. The container must be marked with the word “SHARPS and when full can be put into a non-contaminated broken glass box provided by Environmental Services (formally Custodial Services). You must then mark the box as containing “SHARPS”. The box, when full, can be managed as regular solid waste by Environmental Services personnel.

Minimum Puncture Potential Sharps that **are** Infectious:

An approved sharps container is an infectious waste box supplied by EHS. These types of sharps must be accumulated immediately into the box after use. The infectious waste box must then be marked as containing sharps and will be managed by EHS.

Minimum Puncture Potential Sharps that **are not** Infectious:

An approved sharps container is a broken glass box provided by Environmental Services. This box must be labeled as "SHARPS". This box, when full, can be managed as regular solid waste by Environmental Services personnel.

**IMPORTANT:** The EPA does not allow the accumulation of sharps; including pipettes and pipette tips or other minimum puncture potential sharps, in bags or open containers on a lab bench. All sharps, regardless of their puncture potential, must be accumulated for disposal immediately into an approved sharps container. Although this procedure may, in part, appear overly protective and burdensome it must be followed in order for the university to avoid EPA violations. The EPA has issued notice of violations to the university in the past for failure to follow this requirement.

Please contact Steve Farrell at ext. 3118 if you have any questions regarding these procedures.