

ADVISORY NO. 10.2: MANAGEMENT OF BIOLOGICAL AND INFECTIOUS WASTES

The following recommendations are based on the Ohio Revised Code (ORC), Ohio Administrative Code (OAC) and EPA guidelines regarding biological and infectious waste management. Refer to Advisory 10.1 to access these regulations.

BIOLOGICAL & INFECTIOUS WASTE MANAGEMENT

The objectives of an effective biological and infectious waste management program should be to provide protection to human health and the environment from hazards posed by the waste and should include the following elements:

Segregation - biological and infectious waste should be separated from general waste to assure appropriate handling and treatment.

- Biological and infectious waste should be segregated at the point of generation and placed directly into labeled containers or plastic bags clearly identifiable and distinguishable from the general solid waste stream. These containers should be marked with the biological hazard symbol (**See Appendix A**).
- Those wastes with other hazardous properties (see Advisory 7.3) should be further segregated. Contact Environmental Health & Safety at 556-4968 for appropriate disposal of multiple-hazard waste. Contact the Radiation Safety Office at 558-4110 regarding disposal of infectious radioactive waste. **Refer to the flow chart in Appendix D for proper disposal of infectious waste.**

Packaging - biological and infectious waste should be adequately packaged in order to prevent exposure to waste handlers and the public. Infectious waste containers (red plastic barrels) can be obtained by contacting Environmental Health and Safety at 556-4968. When containers are $\frac{2}{3}$ full, fill out and attach a biological waste disposal label (**Appendix C**).

- Liquid wastes should be placed in tightly capped, labeled bottles.
- Solid and semi-solid wastes should be placed in labeled, plastic bags.
- Needles, razor blades, scalpels, syringes, broken glass, and any other "sharps" must be placed in puncture resistant, labeled containers (**Appendix B**) as per Ohio law. Cardboard boxes, coffee cans, and other non-approved containers may not be used. Clipping needles is not recommended because it may cause an unnoticed release of an aerosol.
- The packaging and disposal of contaminated pipette and pipette tips is covered in **Appendix B**.

Storage - while it is preferable to treat and dispose of biological and infectious wastes as soon as possible after generation, short-term storage is feasible if:

- The packaging provides adequate containment.
- The waste is maintained in a nonputrescent state, using refrigeration or freezing when necessary. If infectious waste becomes putrescent, then the waste must be immediately refrigerated or frozen and shall be treated and disposed of as soon as possible

The storage area has restricted access and is locked or posted with a biohazard symbol.

Transport - proper packaging is necessary to ensure containment during transport within and outside the facility.

- Carts suitable for moving packaged waste within the facility should be disinfected routinely.
- All infectious waste should be placed in rigid, leak-proof containers for transport to an off-site facility.
- Mechanical devices should not be used to transfer or load waste since rupturing of the package may result.

Treatment - treatment is any method, technique or process that is designed to change the biological character or composition of the waste and render it non-infectious.

Current treatment technologies include:

Incineration (current method used for waste generated at the University of Cincinnati)

- Means any equipment, machine, device, article, contrivance, structure, or part of a structure used to burn solid and/or infectious wastes to ash. All incineration shall occur in a multi-chamber incinerator that provides complete combustion of the wastes. A minimum temperature of one thousand two hundred degrees Fahrenheit in the primary chamber and a minimum of one thousand six hundred degrees Fahrenheit in the secondary chamber shall be maintained.

Autoclaving

- All autoclaves shall operate at a minimum temperature of one hundred twenty-one degrees Centigrade or two hundred fifty degrees Fahrenheit at a minimum of fifteen pounds per square inch gauge pressure. This needs to be maintained for a minimum of sixty minutes during a treatment cycle. Autoclaves shall not be used to treat pathological wastes. Please see Safety Advisory 10.5 for additional requirements and information related to using an autoclave to treat infectious waste..

Applied heat encapsulation

- Process only waste loads of sharps that consist of at least seventy per cent by weight of plastic material. Process only waste loads of sharps in a heating chamber within the treatment unit for a minimum treatment time of thirty minutes at a minimum temperature of three hundred thirty degrees Fahrenheit.

Chemical disinfection

- The approved chemical treatment solution shall contain volume per volume, fifteen percent sodium hypochlorite (household grade bleach). All cultures shall be submerged for a minimum of thirty minutes in the chemical treatment solution. Chemical Treatment of infectious waste may result in the University of Cincinnati becoming an Infectious Waste Treatment Facility. Please contact Environmental Health and Safety at 556-4968 for further information.

Chemical treatment utilizing peracetic acid and grinding

- Use a minimum of 17.1 milliliters of 35% peracetic acid when the infectious waste load contains less than or equal to 100 milliliters of blood. Use a minimum of 79.8 milliliters of 35% peracetic acid when the infectious waste load contains greater than 100 milliliters but less than or equal to 1000 milliliters (1 liter) of blood. Operate all treatment units at a minimum of ten minutes per treatment cycle using the following parameters: the grinding cycle shall operate for a minimum of three minutes at the beginning of the treatment cycle. The chemical soak portion of the treatment cycle shall operate for a minimum of seven minutes.

LARGE GENERATOR STATUS

Infectious waste that is generated at quantities above 50 pounds per month requires “large generator” status per Ohio EPA regulations. Large Generator requirements include:

- Registration Certificates
- Segregation and proper packaging of infectious waste
- Treatment of Infectious Waste
- Permitting and Recordkeeping

The University of Cincinnati falls into the “large generator” status. Currently, all infectious waste is collected by an outside vendor for disposal by incineration.

The Environmental Health and Safety Office is the point of contact with Ohio EPA and they maintain the registration certificates, permits and treatment records for Infectious Waste Management. For information or assistance call 556-4968.

SPILL KITS AND CLEAN-UP PROCEDURES

Spill kits are recommended in each area where biological waste is generated. There should be a dedicated container/box labeled as such and a copy of the spill clean-up procedures attached (see **Appendix E**).



Recommended items: Absorbent material, disinfectant (bleach), gloves, biohazard bag, first aid kit, boundary tape

APPENDIX A:

THE BIOLOGICAL HAZARD SYMBOL



The symbol is fluorescent orange or orange-red. The backgrounds may be any color that provides sufficient contrast for the symbol to be clearly defined.

APPENDIX B:

DISPOSAL OF SHARPS WASTE

Sharps waste includes hypodermic needles, syringes, scalpels, razor blades, and contaminated broken glass articles. Containers used for the disposal of sharps should be rigid, non-breakable, leak-proof, puncture resistant, and have a sealing lid. This should be a container specifically designed and approved for sharps. Filled containers are disposed of as a sealed unit.



METHOD OF DISPOSAL

- Containers should be distinctly labeled as BIOHAZARD-SHARPS, employing the universal biological hazard symbol as part of the labeling.
- Containers should not be overfilled, preventing the proper closing of the lid.
- Contact a medical supply vendor (Fisher, Grainger, or a local vendor) to obtain replacement sharps containers. Environmental Health and Safety does not provide them.

DISPOSAL OF PIPETTES AND PIPETTE TIPS

Place items directly into the red infectious waste barrel or in a cardboard box or other rigid container and lined with a biohazard bag. The container/box must be large enough to hold the pipettes and not extend beyond the top of the container. It must also contain the biohazard label and the word “Sharps” or “May Contain Sharps”. Place the bag into a red barrel when 2/3 full.



Pipettes and tips that are not contaminated with biological or chemical materials should be placed into a box or other sturdy container lined with a clear plastic bag and disposed of through the normal solid waste.

Pipettes and tips that are contaminated with chemicals must be disposed of chemical waste. Please visit <http://ehs.uc.edu/chemical> for proper disposal procedures for chemical waste.

APPENDIX C:

**UNIVERSITY OF CINCINNATI
ENVIRONMENTAL HEALTH & SAFETY**

Form #: 148816

INFECTIOUS WASTE DISPOSAL LABEL

Generator Name: **Waste Generator** Location: **1234 Edwards Center**
Faculty/Supervisor: **Fac/Sup Name** Department: **UNIVERSITY HEALTH SERVICES**
Date: **7/1/2013** Phone: **556-4968**

Number of Boxes: 0	Replacement boxes needed: 0
Number of Barrels: 1	Replacement barrels needed: 1
Number of Sharp Containers: 0	

C O N T E N T S :












Plastic	Tubing	Blood
Pipets, Glass		

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An infectious/biological waste disposal label must be attached to all containers being removed by the Office of Environmental Health and Safety.

These labels can be obtained by logging onto our web site: <http://ehs.uc.edu/biological>

APPENDIX D:

UC Biological and Medical Waste Disposal Guidelines	
Items Requiring Disposal	Proper Disposal Method
<p>Sharps</p>  <p>Razor Blades, Syringes, Needles, Scalpels, Lancets, contaminated broken glass, etc.</p>	 <p>Sharps Container: Close Lid and Place into Biohazard Container when full</p>
<p>Laboratory Wastes</p>  <p>Contaminated Pasteur Pipettes, Pipette Tips, Culture Dishes, Culture Flasks, Slide Covers, Specimen Tubes, Inoculating Loops, and Stirring Devices.</p>  <p>Non-Contaminated Broken Glass</p>  <p>Other Non-Contaminated items must be placed in a lined rigid container and disposed of as regular trash</p>	 <p>Puncture resistant biohazard container bearing the biohazard symbol, "May Contain Sharps" label, and locking lid. Either Cardboard Box with liner or Red Barrel with liner. (Supplied by EH&S)</p> 
<p>Other Solid Wastes</p>  <p>Contaminated pathological wastes, Waste materials from the rooms of humans or the enclosures of animals that have been isolated because of a diagnosed communicable disease; Waste materials generated in the diagnosis, treatment or immunization of human beings or animals; Research pertaining to the immunization of human beings or animals or in the production or testing of biologicals; Contaminated gloves, gowns, etc. Any generator designated wastes.</p>	 <p>Puncture resistant biohazard container bearing the biohazard symbol, "May Contain Sharps" label, and locking lid. Either Cardboard Box with liner or Red Barrel with liner. (Supplied by EH&S)</p>
<p>Liquids</p>  <p>Infectious Waste Liquids</p>  <p>Non-Infectious Waste Liquids</p>	<p>Collect in a sealed container and place in biohazard barrel. <i>Exception: OAC 3745-27-30 (C)(3)</i></p> <p>Bleach with a 15% bleach solution for 20 minutes. Pour down sanitary sewer flushing with water for 10 minutes.</p>

APPENDIX E

**INFECTIOUS WASTE SPILL CONTAINMENT/CLEAN-UP
PROCEDURES**

UNIVERSITY OF CINCINNATI

Hazardous Materials Manager: Nick Basil - (513) 556-4977
Environmental Health & Safety (EH&S), P.O. Box 210218, Cincinnati, OH 45221-0218

LOCATIONS OF KITS:

HOXWORTH: Room G408; Vehicles: S80668, S80659, & S80574

UC SAFETY DEPARTMENT: Vehicles: S80627 & S80511

ADDITIONAL LOCATIONS: BUILDING _____ ROOM _____

- 1) INFECTIOUS WASTE SPILL KITS SHOULD BE KEPT IN ALL AREAS WHERE INFECTIOUS WASTE IS GENERATED (see list below for items required in the kit).
- 2) Limit access to the spill area only to authorized personnel; use appropriate protective equipment (gloves, safety glasses, lab coat, etc.)
- 3) Place broken containers and spillage inside bags (in the spill kit), minimizing exposure; broken glass and/or other sharps waste must be put into a sharps container
- 4) Use absorbent materials to collect any liquids spilled in the area. The used absorbent materials shall be considered infectious waste;
- 5) After the spilled materials have been contained, liquids absorbed and solids removed, clean the contaminated area by adequately applying a disinfectant (15% v/v household bleach or a tuberculocidal hospital disinfectant registered with the U.S. EPA). Allow the solution to be in contact with the affected area for a minimum of 30 minutes (for household bleach) or the length of time specified on the manufacturer's label
- 6) Replenish spill containment and clean up kit;
- 7) Call for emergency assistance, as needed (Dial **911** for *University Dispatch*; *Safety Office*: 556-4968; *Work Control*: 558-2500
- 8) Report all infectious waste spills to Environmental Health & Safety (phone: 556-4968).

SPILL KITS SHALL CONTAIN: Absorbent Material, Disinfectant (Bleach), Gloves, Biohazard Bag(s), Boundary Tape and a First Aid Kit.

NOTE: Although most of these items are kept in a laboratory, it is recommended that a dedicated box contain these items and be labeled as such. Also, attach this document to the spill kit container or in another conspicuous location.

EH&S

4/97, 4/98, 4/99, 6/00, 11/00, 4/01, 6/08, 2/12, 10/13, 1/26