

**University of Washington**

**Infectious/Biomedical Waste  
Management Plan**

*JUNE 2005*

By Members Of

UW Infectious Waste Committee  
UW Institutional Biosafety Committee

*Both the University of Washington Infectious Waste Committee and Institutional Biosafety Committee have provided guidance in developing and improving this Infectious/Biomedical Waste Management Plan.*

## **Committee Members**

### **Infectious Waste Committee**

*Members:*

- Gary Butrymowicz Director, Environmental Services, UWMC
- Anne Eskridge Manager, Property & Transport Services
- Robert Carroll Director, Professional and Technical Support, HMC
- JoAnn Kauffman Occupational Health Nurse, Environmental Health and Safety
- Jack Klebeck Assistant Director, HS Academic Services and Facilities
- Robin Olsen-Scribner Epidemiologist, UWMC Epidemiology
- Diana Perey Director, Transportation Services, Facilities Services
- Stephanie Steppe Director, HS Academic Services & Facilities (Chair)
- Karen VanDusen Director, Environmental Health and Safety
- Gene Woodard Director, Facilities Services, Custodial Division

### **Institutional Biosafety Committee**

*Members:*

- Michael Agy Research Scientist, Washington National Primate Research Center
- William Atkins Assistant Professor, Medicinal Chemistry
- David Emery Research Associate Professor, Medical Genetics (Chair)
- Ashleigh Fleishman Sophomore, Pre-Sciences (ASUW Student Member)
- Elaine Jong Medical Director, Hall Health Primary Care Center
- Mary Lampe Associate Professor, Laboratory Medicine
- Pamela Morris Manager of Program Operations, Comparative Medicine
- David Russell Associate Professor, Hematology
- Carol Sibley Professor, Genome Sciences
- Paul Swenson Laboratory Director, Public Health–Seattle and King County (Public Member)
- Donald Wang ZymoGenetics (Public Member)
- Estella Whimbey Director, UWMC Healthcare Epidemiology & Infection Control and Campus Health
- Bruce Whitney Biosafety Officer, Environmental Health & Safety (Contact)
- James Woods Research Professor, Environmental and Occupational Health Sciences

## I. Scope

This plan addresses the portions of Seattle Municipal Code 21.43.030 and Title 10.07.060 of the King County Solid Waste Regulations, requiring that infectious /biomedical waste generators within Seattle and King County prepare a written Infectious/Biomedical Waste Management Plan. This plan covers all aspects of the University of Washington's Infectious/Biomedical Waste Management Program. It also incorporates federal guidelines for research involving biohazards and recombinant DNA, as defined in National Institutes of Health (NIH) Guidelines for Research Involving Recombinant DNA Molecules and Centers for Disease Control (CDC)/NIH Biosafety in Microbiological and Biomedical Laboratories.

### A. Review

The Infectious Waste and Institutional Biosafety Committees will annually review this plan.

### B. Jurisdiction

This management plan applies to activities at all University facilities, including but not limited to Seattle, Tacoma, and Bothell campuses; Hall Health Clinics; University of Washington Medical Center (UWMC); Harborview Medical Center (HMC); Harborview Research and Training Building (HR&T); and leased space, such as the Roosevelt Clinics, Rosen Building, and Western Building. Some University facilities may have additional site-specific plans, based on this plan, but modified to meet other local government and/or accreditation requirements. This information is contained in Appendix B.

## II. Definition of Infectious/Biomedical Waste

The following materials are defined as infectious/biomedical waste:

### A. Cultures and Stocks of Etiologic Agents and Associated Biologicals

This includes, but is not limited to, specimen cultures, cultures and stocks of etiologic agents and agents requiring biosafety level (BSL) 2 and 3 containment, wastes from production biologicals and serums, and discarded live and attenuated vaccines.

### B. Laboratory Waste Which Has Come in Contact with a Biohazard (as listed in Items A and E)

This includes, but is not limited to, disposable laboratory personal protective equipment (gloves, gowns, shoe covers, masks), disposable laboratory plastic ware (culture dishes, plates and flasks, pipettes, and pipette tips), blood specimen tubes, devices used to transfer, inoculate and mix cultures; and paper and cloth which have come into contact with cultures and stocks of etiologic agents.

### C. Sharps Waste

All hypodermic needles, syringes with needles attached, IV tubing with needles attached, scalpel blades, and lancets that have been removed from the original

package.

D. Human Pathological Waste

This includes human tissues and anatomical parts that emanate from surgery, obstetrical procedures, autopsy, teaching and research laboratories. This does not include extracted teeth, hair, toenails, fingernails, human corpses, remains and anatomical parts that are intended for interment or cremation.

E. Human Body Fluids

This includes, but is not limited to, blood and blood products, serum and plasma, cerebrospinal fluid, synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, and amniotic fluid when they are in free-flowing form.

F. Infected Human Body Substances

This includes wastes that have come into contact with human body fluids or tissues from humans infected with, or isolated to protect others from, highly communicable infectious diseases.

G. Animal Waste

This includes, but is not limited to, animal carcasses, body parts, and bedding of animals that are known to be infected with, or that have been inoculated with, pathogenic microorganisms infectious to humans; animals requiring Animal Biosafety Level (ABSL) 2 and 3 containment.

H. Non-Human Primate Waste

This includes, but is not limited to, non-human primate blood, carcasses, tissues, body fluids, and bedding.

I. Recombinant DNA

All contaminated liquid or solid waste from research activities involving risk group (RG) 1 agents requiring BSL-1 and ABSL-1 containment.

All contaminated liquid, solid, carcasses, and animal wastes from research activities involving RG-2 agents requiring BSL-2 and ABSL-2 containment.

All contaminated liquid, solid, carcasses, and animal wastes from research activities involving RG-3 agents requiring BSL-3 and ABSL-3 containment.

Additional wastes may be added at the discretion of the Infectious Waste Committee, in consultation with the Institutional Biosafety Committee (IBC).

### III. Responsibilities

A. Principal Investigators (PI) and/or Supervisors

Individual laboratory principal investigators and/or department managers/supervisors are responsible for developing Standard Operating Procedures (SOPs) for identifying, segregating, and/or decontaminating infectious waste prior to disposal. These individuals are also responsible for ensuring that these SOPs are followed and that their staff is adequately trained to handle biohazardous materials/infectious waste.

**B. Custodial Services**

Custodial Services or Environmental Services, where appropriate, is responsible for transporting treated and properly packaged infectious and sharps waste to the appropriate disposal area.

**C. Property and Transport Services**

Property and Transport Services is responsible for developing and maintaining disposal contracts for sharps waste, infectious waste and treated infectious waste, and are responsible for all communication with contracted vendor services. They also keep waste characterization profile forms current with Public Health–Seattle and King County (see Appendix C).

**D. Environmental Health and Safety (EH&S)**

EH&S serves as the University's official liaison with regulatory authorities, including local and state health jurisdictions. EH&S consults with PI's on proper infectious waste disposal, and performs inspections. EH&S also maintains the Infectious/Biomedical Waste Management Plan.

**E. Infectious/Biomedical Waste Contractors**

Any contractor hauling tainted or untreated infectious/biomedical waste is responsible for being in full compliance with all local, state, and federal regulations regarding infectious/biomedical waste. The Contractor is also responsible for providing University infectious/biomedical waste generators with appropriate packaging materials, packing guidance, and copies of all required manifests in order to comply with appropriate Department of Transportation (DOT) regulations. In some cases, the University contracts for removal, treatment, and disposal of infectious waste. The current infectious/biomedical waste contractor for the University is Stericycle, Inc.

**F. Institutional Biosafety Committee (IBC)**

The IBC is responsible for mandating biocontainment levels for proposed research projects in accordance with the NIH Guidelines for Recombinant DNA and the CDC/NIH BMBL. Additionally, the IBC may lower or increase containment levels for certain experiments.

**G. Infectious Waste Committee**

The Infectious Waste Committee established and reviews infectious/biomedical waste handling practices for the University of Washington community, in compliance with local, state, and federal infectious/biomedical waste regulations.

**IV. Identification**

Individual principal investigators and/or departmental managers/supervisors are responsible for identifying the infectious/biomedical waste generated by their activity and segregating it into the appropriate waste stream. The University's Biohazard Safety Manual provides guidance on this activity. The Biohazard Safety Manual and additional information on Biohazardous Waste is available on EH&S website, [www.ehs.washington.edu](http://www.ehs.washington.edu). At the Medical Centers, assistance is also

available from their Infection Control departments.

## V. Segregation and Containment

Schematic flow charts describing the categories of infectious/biomedical waste streams have been prepared. They are included as part of this plan in Appendix A. They cover the following locations: Magnuson Health Sciences Building, University of Washington Seattle Campus and nearby leased properties (including Rosen, Western, and Roosevelt), Harborview Research and Teaching Building, University of Washington Medical Center, and Harborview Medical Center.

### A. Sharps

Sharps are deposited in red leakproof, rigid, puncture-resistant, durable plastic containers (sharps boxes). These containers are labeled with the biohazard symbol (red in color) and equipped with a tight-fitting lid for use during handling and transport.

Re-usable sharps are safely segregated and contained in leakproof, rigid, puncture-resistant containers while awaiting cleaning, decontamination, and sterilization before re-use.

### B. Liquid Infectious/Biomedical Waste

Liquid infectious/biomedical waste is segregated and contained in leakproof, rigid containers. These containers are labeled with the biohazard symbol and the word "Biohazard." Liquid waste is decontaminated at the site of generation with a University approved chemical decontamination agent. If transport is required before decontamination, transport through public hallways is kept to a minimum. The primary container must be placed within a secondary leakproof, rigid container (e.g., pail, box, or bin) during any transport.

This secondary container must be labeled with the biohazard symbol and the words "biohazardous waste" or words that clearly denote the presence of infectious/biomedical waste. The outer container is either protected from contamination by a disposable liner, which is replaced when the biohazardous waste is removed, or the outer container is decontaminated following each use.

### C. Solid Infectious/Biomedical Waste

Solid infectious/biomedical waste is segregated and contained in red or orange disposable, leakproof bags having enough strength to prevent ripping, tearing, breaking, or bursting under normal use. These red or orange bags are marked with the biohazard symbol and the word "Biohazard."

Waste contained inside biohazard bags is stored and transported within leakproof outer secondary containers (e.g., pail, box, or bin). This container must be labeled with the biohazard symbol and the words "biohazardous waste." The outer container is either protected from contamination by a disposable liner, which is replaced when the biohazardous waste is removed, or the outer container is decontaminated following each use.

### D. Animal Waste and Carcasses

Animal carcasses exposed to pathogens requiring ABSL-2 biocontainment and

all non-human primate carcasses are segregated from other waste and contained in red or orange biohazard bags. The biohazard bags are placed within labeled leakproof outer containers for handling and stored in designated freezers or refrigerators until packaged for shipment to an off-site incinerator. They may also be autoclaved on-site.

Animal waste and carcasses from ABSL-3 biocontainment animals are autoclaved on-site. This autoclaved biohazard waste bag is then placed within labeled leakproof outer containers for handling and stored in designated freezers or refrigerators until packaged for shipment to an off-site incinerator. Packaging for the incinerator consists of placing the bagged carcass in a grey plastic tub having a red plastic liner and tight-fitting lid, and labeled with the biohazard symbol.

Non-infectious (ABSL-1 containment), non-radioactive animal carcasses (including transgenic animals) are placed in plastic bags and stored in designated freezers or refrigerators until packaged to go into the regular waste stream.

E. Human Pathological Waste-UWMC

Human pathological waste is segregated from other waste and contained in a biohazard bag and outer container as noted above in Subsection C. This material is returned to either the UWMC Autopsy Service or directly to the Department of Biological Structure for cremation.

F. Human Pathological Waste-HMC

All specimens requiring gross or microscopic evaluation should be sent to HMC Pathology.

Any solid tissue removed during a surgical procedure which is not sent to Pathology for examination, should be collected in a biohazard bag and taken to the HMC Operating Room (OR) pathological waste discard station.

## VI. Storage, Handling, and Transportation

A. Standard Precautions

Standard precautions are followed when handling and transporting waste. Infectious/biomedical waste is transported in containers, as described in Section V, Segregation and Containment.

B. Untreated Infectious/Biomedical Waste

1. Untreated infectious/biomedical waste is stored in secured exterior or interior locations.
2. Any transporter of untreated infectious/biomedical waste over public roads will have the necessary permits and will follow all local, state, and federal rules and regulations.

C. Trash Chutes

Trash chutes may never be used for infectious/biomedical waste.

D. Sharps Containers

Treated sharps waste is placed into a locked roll-off container that can be held for 180 days before shipping off-site. The University has received a variance from King County Board of Health that allows this extended time. (See variance attached.) The treated sharps containers are handled by special contract. The Infectious Waste Committee and Public Health-Seattle and King County must approve any another method in writing. (See Section IX, Disposal).

#### E. Radioactive Animal Carcasses

Radioactive animal carcasses may be held at freezer temperatures for up to 120 days.

### VII. Treatment

#### A. Decontamination of Infectious/Biomedical Waste \*

The following methods of treatment are used to decontaminate the infectious/biomedical waste:

Infectious/Biomedical Waste Type	Treatment
Cultures, Stocks of Etiological Agents	Steam sterilization
Infectious Lab waste	Steam sterilization.
Sharps Containers	On-site steam sterilizing or off-site treatment
Infected Body Fluids	Chemical decontamination
Human Body Fluids	Chemical decontamination, steam sterilization, sanitary sewer, or absorbed
Human Pathological Waste	On-site cremation (Magnuson Health Sciences) Pathology or O.R. pathological waste discard station (HMC)
Recombinant DNA Lab Liquid/Solid	Chemical decontamination, steam sterilization, off-site treatment
Prions	Contact the Biosafety Officer
All Other Infectious/Biomedical Waste	On-site steam sterilizing or off-site treatment.
ABSL-3 Animal Tissue /Carcasses//Bedding	On-site steam sterilization, then off-site incineration.
ABSL-2 Animal Tissue/Carcasses /Bedding	On-site steam sterilization or off-site incineration
Non-Human Primate Bedding	On-site steam sterilization.

\* The UW Biosafety Manual provides specific guidance and detailed instructions on this topic. Some sharps, which have not been used with biohazards, will not be autoclaved if there is the potential to release noxious fumes at autoclave temperatures. These sharps containers will be designated with a SPECIAL INSTRUCTIONS label.

#### B. Time Limits for Treatment

### 1. Infectious/Biomedical Waste

Infectious/biomedical waste, other than sharps waste, is treated within 14 days of generation and disposed within 5 days thereafter.

### 2. Sharps Waste

Sharps waste is to be treated by on-site steam sterilization within 14 days of sealing the sharps container. Once treated, the sharps waste is placed into a locked roll-off container. Sharps waste that is not steam sterilized on-site is picked up and treated by the University's Infectious Waste Contractor.

## VIII. Treatment Monitoring

Principal investigators and departmental managers/supervisors are responsible for monitoring their autoclaves used to treat the infectious/biomedical waste. The UW Biosafety Manual and the EH&S website provides guidance in the required training, load monitoring, performance monitoring of the autoclave and required recordkeeping.

## IX. Disposal

### A. Solid Infectious/Biomedical Waste

1. Most infectious/biomedical waste generated in University of Washington buildings is steam sterilized on-site, placed in covered dumpsters, and shipped as solid waste by the company Waste Management to the City of Seattle's current disposal site, Columbia Ridge Landfill in Arlington, Oregon. This practice is in accordance with the University's Solid Waste Management Program.

Infectious/Biomedical waste characterizations forms are submitted to Public Health-Seattle and King County on an annual basis and when a new location is added. Copies of these reports are on file with UW Property & Transport Services.

2. Infectious/biomedical waste generated at leased-space locations can also be processed in this manner as long as their location has a sterilization method and Biomedical Waste Characterization form on file with UW Property and Transport Services. If a form is not on file, the untreated infectious/biomedical waste must be picked up by the Infectious Waste Contractor and treated.

### B. Liquid Infectious/Biomedical Wastes

Liquid wastes are disposed via sanitary sewer. Guidelines for decontamination of liquid wastes are in the UW Biohazard Safety Manual.

### C. Sharps Containers

For locations within the Magnuson Health Sciences Building and UWMC, sharps containers are sterilized on-site and placed in one of the three covered, locked, non-compacting dumpsters. These dumpsters are transported by Waste Management company vehicles to the railhead in Seattle, and then by

rail to the Columbia Ridge Landfill at Arlington, Oregon. For non-Health Sciences locations, sharps containers are picked up by Stericycle, Inc., for treatment and final disposal.

Any other handling and disposal of treated sharps must be approved in writing by the Infectious Waste Committee and Public Health–Seattle and King County.

#### D. Human Pathological Waste

Human pathological waste originating from UWMC is routed through the Autopsy Service at the University of Washington Medical Center and cremated on-site in the T-wing. Other human pathological waste is routed directly to the T-wing crematory.

Human pathological waste originating from HMC is sent either to HMC Pathology when evaluation is required or to the HMC O.R. pathological waste discard station.

#### E. Animal Carcasses

Non-infectious (ABSL-1 containment), non-radioactive animal carcasses (including transgenic animals) are placed in plastic bags and stored in designated freezers or refrigerators until packaged to go into the regular waste stream.

Animal carcasses exposed to pathogens requiring ABSL-2 biocontainment are held in freezers at the University until time of shipment to the off-site incineration facility. They may also be treated on-site by steam sterilization and then may enter the general waste stream.

Animal carcasses exposed to pathogens requiring ABSL-3 biocontainment are autoclaved and then held in freezers until time of shipment to the off-site incineration facility.

Stericycle, Inc. transports all biohazardous animal carcasses to its off-site incinerator.

#### F. Animal Bedding/Waste

Non-Human Primate bedding/waste requires autoclaving before entering solid waste stream. ABSL-2 containment animal bedding/waste requires autoclaving before entering the solid waste stream. ABSL-3 containment animal bedding/waste requires autoclaving and then off-site incineration.

#### G. Radioactive Animal Carcasses

Carcasses containing short-lived radionuclides enter the UW's infectious waste stream after being held for decay for ten half-lives. Carcasses containing long-lived radionuclides are packaged and shipped as mandated by Federal and State authorities and sent to an approved nuclear repository site. (For additional information contact the UW Radiation Safety Officer.)

## X. Contingency Planning

Each generator of waste requiring on-site steam sterilization must assure back-up services are available as per the following options:

A. Back-up Autoclave at UW Campus Locations and Leased Spaces

When autoclaves are not operational, other autoclaves are usually available to handle the waste. Any transport of regulated medical waste to back-up facilities is required to be in full compliance with the necessary permits and will follow all local, state, and federal regulations. In the event that emergency/back-up autoclaves are needed, contact the Chair of the Infectious Waste Committee (Stephanie Steppe, Director of Health Sciences Academic Services & Facilities) who can arrange for alternative equipment or services.

B. Back-up Autoclave Not Available

In those locations not having back-up capability, the Infectious Waste Contractor, Stericycle, Inc will dispose infectious/biomedical waste. In these circumstances, UW locations must contact UW Property and Transport Services, at 206-685-1522.

C. Harborview Research and Training Building

Harborview Research and Training Building uses the University's Infectious Waste Contractor as their primary method of treatment and disposal for infectious/biomedical waste. The building has autoclaves available in case of interruption of infectious/biomedical waste service.

## XI. Staff Training for Infectious/Biomedical Waste Handling

It is the principal investigators, departmental managers/supervisors, Custodial Services, Environmental Services, Property and Transport Services, and contracted vendors that have primary responsibility for training staff in the identification of infectious/biomedical waste, and the packaging, storage, transport, decontamination, and handling of infectious waste. Environmental Health and Safety does provide assistance and routinely offers general training.

## XII. Web Links

- A. Autoclaves, Environmental Health and Safety:  
<http://www.ehs.washington.edu/rbsbiosafe/autoclave.shtm>
- B. Biohazardous Waste, Environmental Health and Safety:  
<http://www.ehs.washington.edu/ohsreslab/biowaste.shtm>
- C. Biosafety Manual, Environmental Health and Safety:  
<http://www.ehs.washington.edu/rbsbiosafe/bsmanualindex.shtm>
- D. Environmental Health and Safety (Home Page):  
<http://www.ehs.washington.edu/>
- E. Property and Transport Services:  
<http://www.washington.edu/admin/pts/>
- F. NIH Guidelines For Research Involving Recombinant DNA Molecules:  
[http://www4.od.nih.gov/oba/rac/guidelines\\_02/NIH\\_Guidelines\\_Apr\\_02.htm](http://www4.od.nih.gov/oba/rac/guidelines_02/NIH_Guidelines_Apr_02.htm)
- G. CDC/NIH Biosafety in Microbiological and Biomedical Laboratories:

<http://www.cdc.gov/od/ohs/biosfty/bmbl4/bmbl4toc.htm>