



Regulated Medical, Biological and Sharps Waste Plan

TUFTS ENVIRONMENTAL HEALTH AND SAFETY
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I. Purpose

This document describes policies and procedures that make up the Tufts University Regulated Medical, Biological and Sharps Waste Plan. Included are procedures for collecting, handling and processing Regulated Medical Waste (RMW) for final disposal.

The objectives of medical, biological and sharps waste regulations are to mandate the treatment of all potentially infectious materials and thereby minimize the risk of infection and injury from the mishandling of these wastes to staff, students, solid waste handlers and the public.

There are no federal regulations for processing and disposing of biological and regulated medical wastes. Each state has unique regulations and they vary considerably. In Massachusetts, the Department of Public Health regulates these wastes under 105 CMR 480 - MINIMUM REQUIREMENTS FOR THE MANAGEMENT OF MEDICAL OR BIOLOGICAL WASTE (STATE SANITARY CODE CHAPTER VIII). Depending on where the waste is generated the wastewater authority serving that area may also have additional requirements.

Massachusetts regulations classify the following materials as medical and biological waste and require specific types of processing as well as documentation of that processing:

- Blood and blood products
Note: excludes feminine hygiene products
- Animals and animal wastes: if treated with or contaminated with an infectious disease agent presenting a risk to human health or infected with an agent that causes zoonotic diseases as listed in 105 CMR 300.140
- Pathological wastes: human organs, tissues and body fluids from diagnostic procedures including specimens of such materials
- Cultures of infectious agents: including live or attenuated human or animal vaccines
- Sharps: any object that can cause skin cuts or punctures including: needles, syringes, lancets, Pasteur pipettes, broken glassware, broken plastic ware, scalpels, blades, suture needles and dental wires.
- Biotechnology effluent materials: any waste materials made from microbes or their products including microbes and their products made from genetically altered living microbes (recombinant DNA). This regulation refers to liquid waste forms, not solid waste.

II. Responsibilities

Each individual generating medical and biological waste at Tufts University must identify the wastes, collect the wastes in a proper container, disinfect potentially or known infectious liquid wastes before discharge into the sink and sewer and arrange for the proper management/disposal of solid wastes. Each laboratory or department has their own specific procedures depending on the materials used in that particular lab.

III. Sink and sewer discharge of specific medical and biological wastes

All non-infectious liquid blood and blood products can be disposed of into a laboratory sink without prior treatment.

The Massachusetts State Plumbing Code (248 CMR 10) defines any waste containing recombinant DNA as a special waste. Liquid wastes containing recombinant DNA molecules shall be sterilized or (otherwise) treated (decontaminated) at the point of generation (in the laboratory) before discharge into the sewer system.

On the Boston and Medford campuses, the Massachusetts Water Resources Authority (MWRA) restricts the release of pathogenic agents into the sewer. Hence, any liquids containing these agents must be collected and autoclaved or treated with a chemical agent effective at deactivating all pathogenic microbial agents before discharge into the sink and sewer.

Treat liquid waste containing BSL1 or BSL2 material with 10% bleach (final concentration) or other approved disinfectant for 20 minutes before sink disposal. There should be a residual of at least 1-10 ppm bleach after disinfection is complete. Flush the drain with water after disposal is complete.

Bleach solutions must be Mercury-Free solutions. Check with the vendor for use of the product and contents being mercury free.

IV. Disposal of Regulated Medical Wastes

There are two procedures for disposing of dry, solid Regulated Medical Waste: on-site autoclaving of medical and biological waste and off-site treatment using a commercial vendor disposal site, usually using incineration, autoclaving or other approved method for final treatment and destruction. The method of collection of waste will vary depending on the final disposal method chosen.

Sharps are processed in a separate procedure.

A. On site treatment in an autoclave

RMW must be placed in a clear autoclave bag with no biohazard lettering or symbols. This bag must be placed in an approved container preferably with a lid (using a hands-free step pedal mechanism if available). The bag should not be moved through the hallway to the disposal area unless transported in the appropriate container or other secondary container to prevent spilling of materials or loss of control in the event of bag failure. Each bag of waste to be autoclaved must have a heat sensitive label provided by Tufts EHS that contains the laboratory source information and indicates that the correct temperature has been reached. The autoclave waste tags are filled out by the lab when attached to the bag prior to autoclaving.

The bags required for autoclaving on-site are **CLEAR, POLYPROPYLENE** Bags (high-temperature, autoclave) available through vendors (i.e. Fisher Scientific, VWR).

Dry solid waste being autoclaved should be in a bag, with the bag open at a minimum of one inch (1”) for steam to enter the bag. For completely dry waste, a small amount of water should be added to the bag prior to the run for greater steam generation inside the bag.

Treatment of liquid waste by autoclave is done on a case by case basis. Test runs and sampling can be scheduled and performed as needed. The only autoclaves approved for treatment of liquid are the autoclaves in the Jaharis Basement Glass-washing facility. Anyone seeking to autoclave liquid waste should contact TEHS for guidance. Liquid waste to be autoclaved will require IBC approval prior to initiation. Specific sample collection and treatment is reviewed and specific handling of handling, placement and distribution of materials in the autoclave is required. Specific spore challenge testing in accordance with the liquid, volumes, and placement of materials is required for each waste run treated.

Check with your department if available autoclaves are used for waste treatment and the location. A list of autoclaves used for waste treatment can change at any time. Contact TEHS for the current list of autoclaves and their approved uses.

Items containing bleach ***CAN NOT*** be autoclaved.

The State of Massachusetts requires that a Regulated Medical Waste Logbook be maintained at each autoclave and that each load be entered into the logbook. If there is no Logbook or it is completely filled out, contact the Campus EHS Manager on each campus for guidance.

Note: The use of clear bags permits the treated waste to be placed in the dumpster as trash; red bags indicate that the waste could be infectious hence should not be placed in the dumpster. All red bags are considered infectious at all times.

B. Off-site treatment via incineration or other approved method

RMW destined for incineration must be placed in a strong, impervious red bag (see 105 CMR 480.100) in a cardboard box displaying the phrase biohazard and the biological safety symbol, or for destruction in a black, puncture resistant, recyclable box, (TB-01) displaying the phrase biohazard and the biological safety symbol.

C. Sharps

Sharps are collected in 2, 3, 8 and 17 gallon recyclable sharp containers with a closed top. When these containers are 80% filled, the lid is closed and sealed and prepared for transport to the Storage Room or designated staging area. Sharps are processed in a commercial facility and the container is disinfected and returned for reuse.

Procedures for off-site disposal of Regulated Medical Wastes are campus and school specific as follows:

Boston

Human Nutrition Research Center - Laboratory staff set up covered containers and when filled to 80% of capacity, close and seal cardboard box and transport to a Storage Room where the boxes are shipped via the waste contractor. Sharps containers are collected by a contracted waste vendor for off-site treatment.

School of Dental Medicine - RMW and sharps containers are collected by TMC Environmental Health and Safety staff for off-site treatment.

School of Medicine - Depending on the department and arrangements made waste is generally treated using an autoclave or with the commercial vendor. For the Department of Laboratory Animal Medicine (DLAM) animals and animal wastes are placed in red bags and cardboard boxes for off-site incineration. Sharps containers are collected by a contracted waste vendor for off-site treatment.

Grafton

Biological Research Laboratories - Routine red bag waste and sharps containers are stored at the point of generation. Vendor representative collect and transport to off-site disposal facilities.

Regional Biosafety Laboratory and Building 20 BL3 Suite - Biological waste is first autoclaved, stored onsite or in a Storage Room and transported off-site for final treatment and destruction. Animal waste are placed in a digester for final disposal.

Laboratory Animal Medicine Services (LAMS) – Uninfected animal waste is discarded in routine waste streams. Animal bedding and waste from infected animals is placed in autoclave bags and treated on site. Once autoclaved the waste is placed into the routine solid waste stream. Animal carcasses are placed in red bag waste containers and are stored at the point of generation. Vendor representatives collect and transport to off-site disposal facilities.

Medford

Note: Sharps are collected in 2, 3 or 8 gallon recyclable sharp containers. When 80% filled, these containers are transported off site by a contractor.

Biology Department Depending on the department and arrangements made waste is generally treated using an autoclave or with the commercial vendor. Autoclave waste is treated and disposed in trash. RMW shipped off site is sent by vendor for final treatment and destruction.

Hooper Health Center - Red bags are placed in cardboard boxes and sharps are collected in recyclable sharps containers. These containers are placed in a storage room until removed by off-site disposal contractors.

Chemistry Department - Sharps are placed in recyclable sharps containers until filled. When filled each container is removed for off-site disposal by contractors. RMW is destined for destruction incineration is placed in a strong, impervious red bag (see 105 CMR 480.100) in a black, puncture resistant, recyclable box, (TB-01) displaying the phrase biohazard and the biological safety symbol, or the supplied cardboard box with the biohazard and biological safety symbol.

Psychology Department - Sharps containers are closed and sealed and placed in storage room for off-site disposal by contractors.

Biomedical Engineering- RMW is placed in clear autoclave bags which are contained in labelled, leak proof containers. When filled, these containers are transported to the autoclave for treatment. Final disposal of treated waste is into the trash dumpster.

Chemical Engineering- RMW is placed in clear autoclave bags which are contained in labelled, leak proof containers. When filled, these containers are transported to the autoclave for treatment. Final disposal of treated waste is into the trash dumpster.

V. Signing medical and biological waste manifests

Manifests listing medical and biological wastes must accompany any off-site shipment of waste. These manifests are legal documents and must be signed by authorized persons ONLY. To learn if you are eligible to become authorized, contact TEHS.

VI. Autoclave operations

All individuals who are or plan to operate an autoclave to treat Regulated Medical Waste on site must receive training covering the operation of the autoclave, the routine testing of the autoclave using biological tests (bacterial spore strips or spore vials) and maintaining a bound log book of all items autoclaved. Contact the autoclave vendor or maintenance firm for training on the use of the department specific autoclave. Tufts Environmental Health and Safety provides the autoclave logbooks mandated by the State of Massachusetts, autoclave tags and provides spore testing services for autoclaves used for treatment of regulated medical waste.

In Massachusetts, medical and biological wastes are regulated by the Department of Public Health (105 CMR 480), the Massachusetts Water Resources Authority (Boston and Medford) and the Massachusetts Plumbing Code.

VII. References

105 CMR 480 - State Sanitary Code Chapter VIII: Storage and Disposal of Infectious or Physically Dangerous Medical or Biological Waste

<http://www.mass.gov/courts/docs/lawlib/104-105cmr/105cmr480.pdf>

248 CMR 10.00 – Uniform State Plumbing Code

<http://www.mass.gov/ocabr/licensee/dpl-boards/pl/regulations/rules-and-regs/248-cmr-1000.html>

360 CMR 10.00 – Massachusetts Water Resource Authority – Sewer Use

<http://www.mwra.com/trac/regulations/2009/360-cmr-10.pdf>

Biosafety Support

<http://publicsafety.tufts.edu/ehs/biosafety-support/>

Regulations - Standards - 29 CFR, PART 1910 Occupational Safety and Health Standards

https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10051&p_table=STANDARDS

Attachment 1: Regulated Medical, Biological and Sharps Waste Disposal Guidelines



Regulated Medical, Biological and Sharps Waste Disposal Guidelines

Type of Waste	Treatment	Disposal Method
Agar Plates (expired, not used)	None	Regular Trash
Agar Plates (used)	None	Biohazard Bin/Box
Animal Blood / Body Fluids (potentially infectious)	Bleach (10% solution for 20 minutes)	Sanitary Sewer (drain)
Animal Blood / Body Fluids (non-infectious)	None	Sanitary Sewer (drain)
Animal Carcass / Tissue – infected with known pathogen/transgenic)	None	Biohazard Bin or Biohazard Drum for incineration
Animal Carcass / Tissue	None	Biohazard Bin or Biohazard Drum for incineration
Band Aids	None	Regular Trash
Blades	None	SHARPS Container
Blood – human	None	Sanitary Sewer (drain)
Blood Culture Bottles	None	Biohazard Bin
Blood Test Strips	None	Regular Trash
Body Fluids – human (except urine)	None	Sanitary Sewer (drain)
Capillary Tubes (contaminated)	None	Biohazard Bin
Culturette Swabs	None	Biohazard Bin
Ethidium Bromide Tips	None	SHARPS Container
Glass Tubes (contaminated)	None	Biohazard Bin
Glass Tubes (uncontaminated)	None	Broken Glass Box
Gloves (visibly soiled w/ blood or used in BSL-2 or higher facility)	None	Biohazard Bin
Gloves (unsoiled)	None	Regular Trash
Lancets	None	SHARPS Container
Liquid – (free-draining pathological waste / blood / body fluids)	None	Sanitary Sewer (drain)
Loops (inoculating)	None	Biohazard Bin
Lyophilized Specimens	None	Biohazard Bin

Type of Waste	Treatment	Disposal Method
Media (spent liquid)	Bleach (10% solution for 20 minutes)	Sanitary Sewer (drain)
Media (spent solid)	None	Biohazard Bin
Media (expired, not used)	None	Sanitary Sewer (drain) or Regular Trash
Micro-titer Plates	None	Biohazard Bin
Needles	None	SHARPS Container
Paper / Towels / Mats (contaminated)	None	Biohazard Bin
Paper / Towels / Mats (uncontaminated)	None	Regular Trash
Pathological Waste (solid / not-free draining)	None	Biohazard Bin
Pasteur Pipettes (contaminated)	None	SHARPS Containers
Personal Protective Equipment (potentially contaminated)	None	Biohazard Bin
Petri Dish (used)	None	Biohazard Bin
Petri Dish (expired, unused)	None	Regular Trash
Pipettes – Soft-Plastic (contaminated)	None	Biohazard Bin
Pipettes – Rigid-Plastic (contaminated)	None	SHARPS Container
Pipette Tips (contaminated)	None	Biohazard Bin
Pipette Tips (uncontaminated)	None	Regular Trash
Razor Blades	None	SHARPS Container
Slides (fixed specimen)	None	Broken Glass Box (25 lb. weight limit on container)
Slides (unfixed specimen)	None	SHARPS Container
Slides (broken)	None	SHARPS Container
Specimen Bags grossly soiled	None	Biohazard Bin
Syringe containing potentially infectious material with or without needle	None	SHARPS Container
Syringe without needle (not containing potentially infectious material)	None	Regular Trash
Test Tubes containing potentially infectious material	None	Biohazard Bin
Tissue / Specimens (unfixed)	None	Biohazard Bin
Tissue / Specimens (fixed)	None	Biohazard Bin
Tubes – used (culture, vacutainer, microfuge)	None	Biohazard Bin
Urine Samples	None	Sanitary Sewer (drain)
Urine Transfer Pipettes / Specimen Containers / Test Strips	None	Regular Trash

- **Contaminated:** Materials contaminated with human or animal blood, body fluids, or other potentially infectious materials, including materials that contain bacteria, viruses, parasites, or fungi that can be transmitted to humans, animals or plants. **NOTE:** Even if a material is known to be non-hazardous (i.e., blood from uninfected animals) it is impossible to distinguish from human blood or other infectious materials and has the appearance of being potentially infectious.
 - Materials contaminated with chemical or radiological material must be disposed of through the appropriate waste channels and not placed in the biohazard bins.
 - The generation and disposal of mixed waste (e.g. chemical and biological combined) must be discussed with TEHS prior to initiating these experiments.
- **Uncontaminated:** Materials that are not contaminated with a potentially infectious substance, or materials that have been properly decontaminated by autoclave, bleach, or some other acceptable sterilization / decontamination method. Contact TEHS to ensure that specific decontamination methods meet regulatory standards.
- **Blood & Blood Products:** Any free-draining liquid blood or body fluids from humans or animals, excluding urine.
- **Blood & Body Fluids Contaminated with Chemicals or Radioactive Materials:** These **must not** go down the drain. Contact TEHS for collection / disposal.
- **Sanitary Sewer (drain) Disposal:** Non-Infectious Blood and Blood Products can be disposed of via the sanitary sewer without pre-treatment. Potentially infectious body fluids, spent liquid media, and other pathogenic liquids should be treated for 20 minutes with final concentration of 10% bleach prior disposal down the drain.
- **Biohazard Waste Containers / Bins:** Solid biohazardous waste must be stored in a hard sided, puncture resistant, leak proof container with a lid. The lid must be closed when waste is not being added to the container. Containers must be lined with a biohazard bag and labeled on the outside with a biohazard sign.
- **Broken Glass Boxes:** Broken glass boxes are not to be used for the disposal of any contaminated materials. These containers ultimately end up in landfill. SHARPS should never be put into broken glass boxes. There is a 25 pound weight limit when filling broken glass boxes.
- **Autoclave Treatment:** Treatment of biohazardous waste via autoclaving at Tufts is not considered sufficient for decontamination unless the autoclave has been validated and approved for such use.
- **SHARPS Disposal:** Needles, razor blades, microtome blades, lancets, scalpels, etc. must ALWAYS be disposed of in a SHARPS container. Needles should never be recapped, sheared, bent or broken. The needle and syringe should be put into the SHARPS container as a whole unit, uncapped. SHARPS CONTAINERS SHOULD NEVER BE AUTOCLAVED.