BRISTOL
COMMUNITY COLLEGE

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Biological Waste Management

Revision 1

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1.0 Purpose and Applicability

The purpose of this document is to establish the process through which biological waste and medical waste is handled; whether it is sterilized on-site, or stored, packaged and shipped for off-site incineration. Biological waste is waste from the laboratory that contains or potentially contains biohazardous agents. Laws and regulations are in place to ensure the proper handling of these materials and to offer guidance to those who must do so. Generator requirements are listed in 105 CMR 480.000 and 29 CFR 1910.1030

2.0 Definitions

2.1 Biohazardous Agent:

Refers to an agent that is biological in nature and has the capacity to produce deleterious effects upon biological organisms. Biohazardous agents include, but are not limited to; bacteria, fungi, viruses, parasites, recombinant products, allergens, cultured human and animal cells and the potentially biohazardous agents these cells may contain, and other biohazardous agents as defined by State and Federal regulations.

2.2 Medical or Biological Waste:

In Massachusetts this waste is defined as waste that, because of its characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or pose as a substantial present potential hazard to human health or to the environment when improperly treated, stored, transported, disposed of, or otherwise managed. The following are included in infectious medical wastes: blood and blood products; pathological waste; cultures and stocks of infectious agents; contaminated animal waste; sharps; and biotechnology by-product effluents.

2.3 Sharps:

Items that are capable of puncturing, cutting or abrading the skin. Sharps include, but are not limited to; razor blades, syringes, and needles. Sharps shall be segregated from other wastes and placed immediately after use in red, fluorescent orange or orange-red leak proof, rigid, puncture-resistant, shatterproof containers that resist breaking under normal conditions of use and handling, and that are marked prominently with the universal biohazard warning symbol and the word “Biohazard” in a contrasting color.

2.4 Incineration:

A thermal treatment that involves the combustion of organic materials and/or substances using high temperature. Bristol Community College uses a state contracted vendor for the pick-up and disposal via incineration of sharps generated by campus laboratory activities.

2.5 Autoclave:

Closed vessel used to sterilize an object using high temperature steam. Parametric monitoring is automated equipment that records critical parameters appropriate for the treatment process of rendering medical or biological waste non-infectious including but not limited to time, temperature, and pressure.

2.6 Animal Bedding

Animal bedding must be bagged, placed in a dumpster and disposed of in a sanitary landfill. Bedding contaminated with biohazardous waste, (e.g., from animals shedding pathogens) must be decontaminated by autoclaving before disposal.

3.0 Roles and Responsibilities

3.1 Safety Officer:

Advises the college on all matters relating to the use of biological agents. The safety officer advises faculty, staff and students on waste disposal policies, disinfection policies, risk assessments, hazardous waste training, and autoclave management program, etc.

3.2 Laboratory Staff**:**

Laboratory technicians, work study students and any other persons that are working in the laboratory. The laboratory staff is responsible for collecting and autoclaving biohazardous waste, maintaining the usage log and reporting any problems to the safety officer.

3.3 College Safety Committee:

College personnel are responsible for the annual review of the biological and medical waste management program.

4.0 Procedures for Managing Biological/Infectious Waste

4.1 Program for Autoclave (Steam Sterilization) Treatment of Biohazardous Waste

4.1.1 Collection:

Solid biological waste which includes discarded cultures and stocks of infectious agents and their associated biologicals, including culture dishes and devices used to transfer, inoculate, and mix cultures, and waste contaminated with potentially infectious agents, should be collected in approved clear, autoclavable bags. These bags must be maintained in biohazard labeled secondary containment until they are

placed into an autoclave, or if ever removed from an autoclave due to a malfunction.

4.1.2 Recordkeeping Log:

a. Use the log sheets provided near the autoclaves. Massachusetts mandates that these records be kept up to date for every run.

b. These log sheets are maintained in a logbook with secured, consecutively numbered pages. These logs are kept for three years.

c. Challenge testing with *Geobacillusstearothermophilus* biological indicators are run quarterly (or more often as needed) to verify that successful kill levels have been achieved. A successful run is quantified by at least a 1.0×10^4 reduction in heat resistant organisms and the type of bacterial indicator selected should contain this volume or more of *Geobacillusstearothermophilus*.

d. When a 4 log 10 bacterial spore reduction has not been demonstrated (results indicate bacterial growth), the processed waste must be held until corrective actions have been taken. An operations and mechanical systems assessment shall be conducted by a qualified individual who has received training from the manufacturer in the operations and maintenance of the equipment. Appropriate corrective actions shall be implemented when warranted, including but not limited to mechanical adjustments and, when applicable, recalibration of all parametric monitoring devices followed by re-treatment of the waste and additional challenge testing to confirm the effectiveness of any implemented corrective action. (105 CMR 480.150).

e. All parametric monitoring equipment utilized in conjunction with autoclaves, shall be calibrated at a minimum annually by an individual who has received training from the manufacturer in the operations and maintenance of the equipment.

f. When implemented, corrective actions pursuant to 105 CMR 480.150(E)(4) shall be documented in detail including the date, name of the individual implementing the corrective actions and a description of the work performed, on the back of the applicable record-keeping log form for medical or biological waste treated on-site.

4.1.3 Autoclaving Procedure:

a. Place materials in a **clear** autoclave bag. No biohazard symbol should be visible. Do not use red or orange biohazard bags to autoclave biohazardous waste as these bags cannot be disposed of as regular trash.

b. The clear bag should be loosely packed and less than ¾ full. Bags should not be packed so tightly that steam cannot penetrate the entire load.

c. Loosely tie the bag with a twist tie. Do not seal the bag shut as the opening should remain an inch in diameter.

d. Place bag(s) in a large, autoclavable, leak-proof bin. The container should be large enough and shallow enough to allow for ample steam circulation. If autoclaving more than one bag, make sure that there is ample room between the bags so that steam circulation is not impaired. Do not overcrowd the autoclave. Bags should not be able to touch the sides or the top of the autoclave and should be on a rack so that they are not in contact with the bottom.

e. To autoclave liquid waste, place the liquid in a beaker or autoclavable bin.

f. Autoclave at 121°C for 60 minutes.

4.1.4 Disposal:

Once the autoclave run is complete and your parametric monitoring indicates a successful run, you will allow the waste to cool. Once the waste is cool, you will need to place a sticker on the clear AUTOCLAVE bag with the name of the building and room number that generated the waste. Place the cool, labeled autoclaved bag(s) inside a black trash bag and dispose of them as general solid waste trash (dumpster). There is no need for a sticker on the outside of the black bag.

4.2 Laboratory Storage and Handling of Biohazardous/Infectious Medical Waste (Bio-boxes)

This method is only for labs that generate:

- Sharps containers
- Small scale biohazardous waste that have no access to an autoclave

a. “Working” containers of infectious medical or biohazardous waste must be maintained in secondary containment and this containment must be covered and labeled with biohazard symbols. Step cans with hands-free operation and with a biohazard label are strongly recommended for this purpose.

b. Infectious medical or biohazardous waste stored on site will be maintained by the generator within a time limit to prevent the development of offensive odors.

c. Infectious waste is collected in clear autoclave bags (no biohazard symbol) and may not be placed on the floor while awaiting pick-up or autoclaving. This waste should *temporarily* reside in an appropriately labeled (biohazard symbols applied) bin until the waste is treated on site.

d. Infectious medical or biohazardous waste to be treated shall be maintained in a designated accumulation area, which is secured, to deny access to unauthorized persons, marked with the appropriate warning signs, and which provides protection from animals, rodents and natural elements.

e. Warning signs should be posted to prevent unauthorized access such as: “CAUTION, BIOHAZARDOUS WASTE STORAGE AREA”.

4.3 Special Waste Requests

Special waste requests will be handled on a case by case basis. If you have any questions concerning disposal of biological wastes or other wastes please contact the safety officer.

4.4 Storage of Biological/Infectious Waste

a. Medical waste to be collected by the contracted vendor shall be maintained in a designated accumulation area (J130), which is secured, to deny access to unauthorized persons, marked with the appropriate warning signs, and provides protection from animals, rodents and natural elements.

b. Warning signs should be posted to prevent unauthorized access.

c. Medical waste stored on site will be maintained by the generator for a limited time to prevent the development of offensive odors.

4.5 Treatment of Waste

1. Permitted Waste Treatment Facilities
   All waste collected by the contracted vendor is transported to a permitted facility for proper treatment and subsequent disposal.

2. Waste Treatment Methods/Parameters
   a. Sharps are subjected to incineration or other approved treatment technologies.

   b. Small scale biohazardous waste (blood samples, etc.), from laboratories is autoclaved on sight and disposed of as explained previously.

3. The contracted vendor's waste treatment facilities operate in compliance with all applicable federal, state and local laws/regulations and maintain all required permits and licenses.

4. In accordance with M.G.L. c. 111 §§ 3, 5, and 127A and 105 CMR 480.000: Minimum Requirements for the Management of Medical or Biological Waste State Sanitary Code, Chapter VIII), generators of medical or biological waste, shipped off-site for treatment, shall maintain a current record-keeping log with the following information: the exact date of shipment; the total number of containers; the type of waste; the total combined weight or volume; the name of the transporter with transporter identification number (if applicable); the verification (via check box) of shipping papers generated with receipt of corresponding tracking forms for each shipment; and the printed name and signature of the person responsible for shipping the waste.

5. There is a **Hazardous Waste Accumulation Record-Keeping Log** in J130 where the waste is stored prior to pick up. This log (mandated by 105 CMR 480.000) is maintained by the safety officer.

5.0 Key References

105 CMR 480.000: Minimum Requirements for the Management of Medical or Biological Waste (Massachusetts State Sanitary Code Chapter VIII)

29 CFR 1910.1030: blood borne pathogen standard

29 CFR 1910.1450 OSHA Lab Standard: Occupational exposure to hazardous chemicals in laboratories