The University Of
TAMPA

Biohazardous Waste Disposal Policy

Effective January 2015

Revision 1.5

RECORD OF AMENDMENTS

Date	Section	Amendment	Initial
08/22/16	All	Replace References to Chemical Hygiene & Biological Safety Officer	LKJ

When using a paper copy of this document, verify that it is the same revision level as the on-line version.

I. Table of Contents

1. PURPOSE AND SCOPE

This policy stipulates proper procedures for the collection, decontamination, and disposal of laboratory-generated biohazard waste. This policy has been developed in order to minimize the risk of exposure to those who may come into contact with biohazard waste generated in a University of Tampa research or class room laboratory. This policy may specifically refer to the following activities:

- Generating and collecting biohazardous waste during research;
- Support staff retrieving, transferring, and autoclaving the biohazard waste;
- Housekeeping staff who may come into contact with autoclaved waste;
- Facilities staff (plumbers, electricians, HVAC, welders, etc.), emergency personnel, and infrequent visitors to the lab; and
- Waste contractors engaged to remove generated biohazardous waste.

Biomedical waste is any solid or liquid waste which may present a threat of infection to humans. The purpose of this policy is to control workplace areas with the potential for bloodborne pathogens and to monitor their disposal.

1.1 REGULATORY STANDARD

Guidelines for management of biomedical waste are found in Chapter 64E-16, Florida Administrative Code (F.A.C.), and in section 381.0098, Florida Statutes.

1.2 DEFINITIONS

Biomedical waste - Any solid or liquid waste which may present a threat of infection to humans, including non-liquid tissue, body parts, blood, blood products, and body fluids from humans and other primates; laboratory and veterinary wastes which contain human disease-causing agents; and discarded sharps. The following are also included:

(a) Used, absorbent materials saturated with blood, blood products, body fluids, or excretions or secretions contaminated with visible blood; and absorbent materials saturated with blood or blood products that have dried.

(b) Non-absorbent, disposable devices that have been contaminated with blood, body fluids or, secretions or excretions visibly contaminated with blood, but have not been treated by an approved method.

Body fluids - Those fluids which have the potential to harbor pathogens, such as human immunodeficiency virus and hepatitis B virus and include blood, blood products, lymph, semen, vaginal secretions, cerebrospinal, synovial, pleural, peritoneal, pericardial and amniotic fluids. In instances where identification of the fluid cannot be made, it shall be considered to be a regulated body fluid. Body excretions such as feces and secretions such as nasal discharges, saliva, sputum, sweat, tears, urine, and vomitus shall not be considered biomedical waste unless visibly contaminated with blood.

Decontamination - The process of removing pathogenic microorganisms from objects or surfaces and thereby renders them safe for handling.

Sterilization - A process which results in a minimum Log 6 kill against Bacillus Stearothermophilus spores utilizing steam or a minimum Log 6 kill against Bacillus Subtilis spores utilizing dry heat, chemicals, or microwave shredding.

Treatment - Any process, including steam, chemicals, microwave shredding, or incineration, which changes the character or composition of biomedical waste to render it noninfectious by disinfection or sterilization.

2. TRAINING FOR PERSONNEL

Biomedical waste training will be scheduled as required by paragraph 64E-16.003(2)(a), F.A.C. Training sessions will detail compliance with this operating plan and with Chapter 64E-16, F.A.C and will include all of the following elements:

- Definition and Identification of Biomedical Waste
- Segregation
- Storage
- Labeling
- Transport
- Procedure for Decontaminating Biomedical Waste Spills
- Contingency Plan for Emergency Transport
- Procedure for Containment

☐ Treatment Method

The University of Tampa will maintain records of employee training for a minimum of three (3) years and will be available for review by Department of Health [DOH]). These records will be kept at the Chemical Hygiene Officer's [CHO's] office, Thompson Building Box 96-F.

3. IDENTIFICATION BIOHAZARDOUS WASTE

Items of sharps and non-sharps biomedical waste generated in this University typically originate from:

- Materials contaminated or potentially contaminated during the manipulation or clean-up of material generated during research and/or teaching activities requiring biosafety level 1 or 2, or animal or plant biosafety level 1 or 2.
- Human liquid blood and body fluids.
- Human tissue and anatomical remains.
- Materials contaminated with human tissue or tissue cultures (primary and established) because these are handled at BSL-2.
- Animal carcasses, body parts, blood, fluids and bedding from animals infected with BSL2 agents.

The following is a list of known locations that generate biosafety level 2 [BSL-2] biohazardous wastes within the University of Tampa:

Cass Science Building – Laboratory Room 201A
Plant Hall Science Wing SC-114
Physician's Assistant & Nursing Program - GHS
Dickey Health Center
Science Research Laboratory Bldg.

4. STORAGE OF BIOHAZARDOUS WASTE

4.1 CONTAINMENT

Red bags for containment of biomedical waste will comply with the required physical properties. Our red bags are manufactured by:

Fisher Scientific

New supplies of red bags are found at:

Cass Science Building – Laboratory Room 205

Sharps will be placed into sharps containers at the point of origin. Filled red bags and filled sharps containers will be sealed at the point of origin. Red bags, sharps containers, and outer containers of biomedical waste, when sealed, will not be reopened in this facility. Ruptured or leaking packages of biomedical waste will be placed into a larger container without disturbing the original seal.

4.2 LABELING

All sealed biomedical waste red bags and sharps containers will be labeled with this facility's name and address prior to offsite transport. If a sealed red bag or sharps container is placed into a larger red bag prior to transport, placing the facility's name and address only on the exterior bag is sufficient. Outer containers must be labeled with our transporter's name, address, registration number, and 24-hour phone number.

4.3 STORAGE

When sealed, red bags, sharps containers, and outer containers will be stored in areas that are restricted through the use of locks, signs, or location. The 30-day storage time period will commence when the first non-sharps item of biomedical waste is placed into a red bag or sharps container, or when a sharps container that contains only sharps is sealed. Indoor biomedical waste storage areas will be constructed of smooth, easily cleanable materials that are impervious to liquids. These areas will be regularly maintained in a sanitary condition. The storage area will be vermin/insect free. Outdoor storage areas also will be conspicuously marked with a six-inch international biological hazard symbol and will be secure from vandalism.

Biohazards waste containers that are full, properly sealed and labeled will be stored in Cass Science Building – Storage & Autoclave Room 170C until vendor arrives for pickup.

5. DISPOSAL OF BIOHAZARDS WASTE

If biomedical waste is in a liquid or semi-solid form and aerosol formation is minimal, the waste may be disposed into a sanitary sewer system or into another system approved to receive such waste by the Department of Environmental Protection or the DOH. Biomedical waste must be properly treated prior to its sterilization or transfer and final burial in the landfill or incineration.

Regulated Medical Waste Disposal Chart	
Blood and body fluids (Regulated medical waste)	Treated with bleach or autoclaved and put down the sanitary sewer.
Microbiological Waste including Biosafety Level 1 and 2 organisms: (Regulated medical waste)	Autoclaved at 121°C. (Autoclaves are tested weekly using bio indicators *Geobacillus stearothermophilus*) or chemically treated.
Pathological waste (animal carcasses infected with human BSL1 and BSL2 this includes transgenic mice) (Regulated medical waste)	Animals are incinerated by University approved vendor.
Pathological waste (animal carcasses that were used for in vivo testing of pharmaceuticals) (Regulated medical waste)	Animals are incinerated by University approved vendor.
Uninfected Animal Carcasses	Animals are incinerated by University approved vendor.
Non-hazardous Sharps	Sealed sharps containers sent to landfill
Biohazardous Sharps	Red plastic sharps containers are autoclaved then sent to landfill

5.1 Biohazardous Sharps

- Sharps include items such as:
- razor blades
- scalpels
- lancets
- syringes with/without needles
- slide covers, and
- specimen tubes

Biohazardous sharps are collected directly into red, plastic containers that bear the biohazard symbol. Federal OSHA regulations (CFR 1910.1030) require biohazard laboratories to minimize their use of sharps whenever possible and those needles not be recapped, purposely bent, broken, or otherwise manipulated by hand. To avoid accidents related to overfilling the containers, remove the containers for disposal when they are 2/3 full.

When removing the sharps container from a biosafety cabinet, always decontaminate the exterior of the container. Containers of sharps contaminated with biohazardous materials should be autoclaved in an orange autoclavable bag marked with an "x" over the bag's biohazard symbol. After autoclaving, the bags with the containers of sharps can be disposed of with the regular trash.

Non-hazardous sharps should be placed in the white plastic sharps containers. The non-hazardous sharps containers should be disposed of in regular trash once they are 2/3 full and properly sealed.

While small shards of contaminated broken glass can be placed into the sharps containers identified above, large contaminated broken glass items must be autoclaved separately in a hard-walled container (such as a cardboard box) lined with an orange biohazard bag bearing an autoclave tape indicator "x" over the bag's biohazard symbol. Place the tape on the orange bag before it is used to line the box to prevent contact with biohazardous materials and sharps. The universal biohazard symbol should also be found on the outside of the box. After autoclaving, the glass waste can be disposed of in the regular trash.

DO NOT enclose the cardboard boxes used for gathering sharps/glass within an autoclave bag. This will prevent steam penetration during autoclaving. Steam penetration is crucial during the decontaminating process. Remember to line the boxes with an orange autoclave bag marked with an "x" over the biohazard symbol before lining the box.

5.2 GLASS PASTEUR AND PLASTIC PIPETTES

5.2.1 Outside of the Biosafety Cabinet

Large scale collection of contaminated Glass (Pasteur) and plastic pipettes should be collected in a lined puncture-resistant outer container (such as the box the pipettes came in) with an orange autoclave bag marked with a heat sensitive autoclave tape "x"over the biohazard symbol. To avoid possible exposure, place the indicator tape "x" over the bag's biohazard symbol prior to loading the bag with pipettes. The universal biohazard symbol must also be displayed on the outer container. When the box is full, close the inner bag leaving an opening for the steam to penetrate. Tape the outer box closed with autoclave tape. Do not use colored tape to close box.

On the benchtop, pipette tips are to be collected in a small autoclave bag lining a wire stand or other container bearing the biohazard symbol. When 2/3 full, loosely close the bag to allow for steam penetration, spray with disinfectant and place with other solid biohazard waste.

5.2.2 Inside of the Biosafety Cabinet

For frequently removed small scale collection, such as sterile pipetting in a biological safety cabinet, line a small orange autoclave bag inside a hard-walled collection container inside the cabinet. When the bag is 2/3 full, close it loosely, spray with proper disinfectant and transfer it to a larger scale pipette collection container located outside of the cabinet.

5.2.3 Contaminated Solids

Biohazard solids consist of:

- culture dishes and flasks;
- Petri dishes;
- solid waste cultures/stocks from the testing and production of biologicals;
- Personal Protective equipment (gloves, gowns, masks, etc.); and
- Other solid material potentially contaminated under the definition of biohazard waste (above)

The outer collection container must be durable, leak proof, have a lid and be of such a design so as not to be mistaken by Housekeeping as regular trash. This container must be labeled with a biohazard sticker.

5.2.4 Contaminated Liquids

Although the rules and definitions for liquid biohazard waste vary somewhat from solid waste procedures, autoclaving is the method of choice for disinfection of the following:

- Animal blood/body fluids from animals infected with BSL2 and BSL3 agents.
- Human tissue culture, human cell lines (primary or established)
- Human body fluids as defined under the Laboratory Standard Operating Procedure.
- Liquid growth media removed from human tissue cultures

Autoclaved liquid wastes may be discharged directly to the sanitary sewer.

Chemical disinfection may be an acceptable alternative to autoclaving liquid biohazard waste generated in research laboratories such as bleach treatment. When this is done, care must be taken to avoid splash and the drains must be flushed with generous amounts of water.

Chemical disinfection of regulated liquids followed by disposal to the sanitary is not generally allowed without prior approval obtained. Regulated liquids typically include the following:

- Liquid waste media from cells/tissue used for propagating risk group 1, 2, or 3 pathogens or toxins, including those produced in recombinant DNA procedures.
- "Microbiological waste" e.g. cultures and stocks of infectious agents from animals intentionally infected with microbes, viral vectors, or toxins

5.2.5 Drosophila

An alternative to autoclaving Drosophila is dumping anesthetized flies directly into a container with a small amount of mineral oil or a bottle containing either ethanol or isopropanol. If you do not plan to re-use the material, these bottles must be labeled as ethanol, isopropanol or mineral oil waste to be picked as hazardous waste. It is preferred to reuse the liquid and label the bottle recycled ethanol, isopropanol etc. Note: These chemicals cannot be poured down the sink or sanitary sewer. They must be discarded as hazardous waste.

5.2.6 Contaminated Animal Carcasses, Body Parts, and Bedding

Animal carcasses are disposed of through incineration and should be placed in boxes marked for incineration. No needles or other type of metal and no PVC plastic are to be placed in the collection boxes. Use only non PVC plastic bags. Carcasses contaminated with radioisotopes or carcinogens shall be reported to the CHBO prior to disposal.

5.2.7 Human Tissues/Body Parts

Recognizable human anatomical remains or tissues and large tissues must be disposed of by incineration. Remains contaminated with hazardous chemical or radioactive sub stances require special disposal and the CHBO must be contacted for disposal.

Unrecognizable human tissues can be autoclaved and disposed of in regular trash. If the tissues have been chemically preserved they can be disposed of as chemical hazardous waste.

5.3 TRANSPORT

The University will contract with a DOH registered biomedical waste transport and disposal company. The University will maintain all pick-up receipts provided to us for the last three (3) years. Currently, the transport and disposal vendor provided to our facility is:

Company name:	BioSecure Waste Solutions, LLC
Address:	107 N 11th Street; #614
	Tampa, FL 33602
Phone:	1.833.777-4733
Registration number:	29-64-3080449 (Cass)
Place pick-up receipts are kept:	Online Dropbox/OneDrive

6. AUTOCLAVE OPERATIONS

6.1 Loading and Unloading the Autoclave Safely

Contaminated materials should never be left in hallways or other public spaces prior to autoclaving. Biohazard bags should remain in the laboratory until they are ready to be placed in

the autoclave. Never leave bags sitting on the floor next to the autoclave. Bags that are closed and ready for autoclaving must be placed in secondary containment. If the bags are being transported to the autoclave, they must be contained in closed, hard walled secondary containers.

Minimize contact with biohazard waste as much as possible. Never crush or push down biohazard waste. Biohazard waste containers should be prepared for autoclaving when they are 2/3 full. Indicator tape should be applied when placing the new autoclave bag into the hard-walled outer container; this will reduce handling of the biohazard waste during removal. The heat sensitive autoclave tape should be placed in an "X" pattern over the biohazard symbol. The heat sensitive tape is to be of the type that changes color, such as the type that the word "autoclaved" appears after treatment. This tape is available from Fisher Scientific as # 15-903. Once the autoclave disinfection is complete, the tops of the bags may be sealed tightly with lab tape.

After the proper autoclave waste decontamination steps are followed as listed below, the decontaminated waste is then placed in a 44 gallon or 32 gallon garbage container, lined with black plastic garbage bags, and located in the vicinity of the autoclave. These containers are to be labeled "AUTOCLAVED/ DECONTAMINATED WASTE ONLY". Biohazard bags placed in the white containers and marked with the heat sensitive tape signal to Housekeeping that the waste is safe and ready to be removed from the laboratory for disposal in the dumpster.

Housekeeping is instructed to not remove or otherwise handle overflowing waste or waste in untreated biohazard bags.

6.2 Autoclaving Precautions

Autoclaving, or steam sterilization, is the most dependable procedure for the destruction of all forms of microbial life. Proper temperature and exposure time are critical factors in ensuring the reliability of this method. These critical factors are dependent upon steam penetration to every part of the waste load. Therefore, the autoclave user must be mindful to prevent the entrapment of air. If all the air is not allowed to escape from the waste during the cycle, it cannot be replaced by steam. Saturated steam is employed under pressure (at least 15 pounds per square inch) to achieve a chamber temperature of at least 121 C (250 F) for a minimum of 15 minutes. This time is measured after the temperature of the steam saturated material being sterilized reaches 121 C.

The hazards associated with autoclaves include extreme heat and high pressure and large, heavy doors and loading carriage. When operating an autoclave the following safety procedures must be followed:

1. Become familiar with the autoclave's owner's manual as each manufacturer recommendations for use can vary widely.
2. Firmly lock autoclave doors and gaskets in place before you run the autoclave to prevent a sudden release of high-pressure steam.
3. If you have an older autoclave that has little or no heat shielding around the outside, attach signs warning of "Hot Surfaces, Keep Away" on or next to the autoclave to remind people of the hazard.
4. Do not stack or store combustible materials (cardboard, plastic, volatile or flammable liquids, compressed gas cylinders) next to an autoclave.
5. Do not autoclave toxic, volatile or radioactive material. If you have biohazard waste that contains any of these materials, please contact the CHBO for guidance.
6. When a cycle is complete, wait approximately 1-2 minutes after the pressure gauge reads zero before opening the door of the autoclave.
7. Wait at least 30 seconds after opening the door before reaching or looking into the autoclave.
8. Open the door slowly, keeping head, face, and hands away from the opening.
9. Allow contents to cool before removing them from the autoclave.
10. Remove solutions from the autoclave slowly and gently as some solutions can boil over when moved or when exposed to room temperature. Thick, heat-resistant gloves, safety goggles or face shield and a rubber apron must be worn when removing hot liquids from the autoclave. Liquids should stand for over 1 hour before being handled without heat-resistant gloves.
11. Clean up any spills immediately.
12. Report any malfunctions or accidents immediately to your supervisor.

6.3 AUTOCLAVE WASTE DECONTAMINATION PROCEDURES

Typically the autoclave is operated at 121°C (250°F) or higher for a minimum of 60 minutes for most biohazard waste (see chart below). The time and temperature used for each type of waste in the laboratory must be validated using biological indicators to ensure effective sterilization (see procedure below). Some autoclaves are equipped to operate at higher temperatures, which would allow for shorter exposure times.

Criteria for Autoclaving Typical Materials	
Material	**Temperature & Time**
Laundry	121°C (250°F) 30 minutes
Trash (biohazard bags containing infectious waste)	121°C (250°F) 1 hour
Glassware	121°C (250°F) 1 hour
Liquids	121°C (250°F), each gallon 1 hour

Animals	121°C (250°F) 8 hours

6.3.1 Liquids

Use the appropriate autoclave settings. Autoclaves may have settings for "LIQUIDS" to be used for liquid materials. "LIQUID" settings run for longer periods at lower temperatures to minimize liquid evaporation and spills. For solid materials, the "DRY GOODS WITH VACUUM" should be used for infectious waste as it is the most effective at moving steam and heat into the deepest parts of large bags producing the best conditions for killing persistent organisms. "DRY GOODS WITHOUT VACUUM" should only be used for clean items that need to be sterilized. Exhaust settings should also be appropriate for the type of waste being autoclaved. FAST exhaust should be used for solid items and SLOW exhaust should be used for liquids.

6.3.2 Solid Waste

Do not overfill waste bags or the autoclave. This will interfere with steam penetration. Add about 50-100 ml (~¼ to ½ cup) of water to each bag of solid waste to facilitate steam penetration in the bag. If there is naturally occurring water in the load, adding additional water is not necessary. Keep the waste bags slightly open to allow for steam penetration. Bags are placed into stainless steel or polypropylene trays prior to autoclaving.

6.3.3 Liquid Waste

Liquids should be placed in borosilicate (Kimax or Pyrex) or polypropylene containers for autoclaving. The containers should not be filled to more than 75% capacity. The caps or stoppers on the containers should be loosened. Never autoclave sealed containers of liquid. This could result in an explosion of superheated liquid. Liquid containers should be placed in a stainless steel or polypropylene tray with ¼ to ½ inch of water in the bottom of the tray. The tray should be placed on a shelf in the autoclave and not on the bottom of the chamber.

6.4 AUTOCLAVE CYCLE TESTING AND VERIFICATION

Autoclaves can be monitored under conditions of full loading for effectiveness weekly through the use of biological indicators. Geobacillus stearothermophilus indicators must be used with average spore populations of 104 to 106 organisms. There are many commercially available biological indicators with a choice of spore ampoules or spore strips with growth media.

Follow the instructions provided by the manufacturer of the biological indicators. Most require refrigeration when kept in storage.

Place the indicator in the middle of the waste bag or material to be autoclaved. It is best to put the indicator in the waste bag before it is filled completely. To aid recovery of the indicator after

sterilization, tape it to a brightly colored sheet of paper or to a long string allowed to protrude from the bag. Indicators can also be placed in test waste bags filled with materials that simulate full loading for the test.

Autoclave the waste following normal procedures. Once the cycle is complete and contents have cooled, remove the indicator from the waste bags wearing appropriate protective equipment. Prepare and incubate the indicator and a control indicator that was not autoclaved as recommended by the manufacturer.

Check for signs of growth at regular intervals during the incubation period (8, 12, 24 and 48 hours). There should be signs of growth on the control indicator that was not autoclaved or the test is invalid. If there are signs of growth on the indicator placed in the waste, the waste was not sterilized properly. The time, temperature and autoclave procedures should be re-evaluated. If an autoclave problem is suspected, Facilities must be contacted immediately for repair.

A log of each test should be maintained, which includes the type of indicator used, date, time, and result of the test.

The waste does not have to be held until the results of the testing confirm effectiveness. If test results indicate that the autoclave is not sterilizing properly, the autoclave should not be used for waste until it has been repaired. The first load run in the autoclave should be tested with a biological indicator to insure proper functioning of the autoclave.

6.5 Autoclave Preventative Maintenance

Autoclave operators should perform the following preventative maintenance on their autoclave to maintain the autoclaves effectiveness:

1. Remove the plug screen or drain strainer to make sure it is free of dirt, dust, or sediment that may collect in it and it should be cleaned as necessary.
2. Clean the interior surfaces of residues collected from the steam or materials being sterilized as needed.
3. Visually inspect the gaskets, doors, shelves and walls for residue buildup or wear regularly.
4. Report any problems with your autoclave to Facilities Services.

6.6 TRAINING

All faculty that use an autoclave must complete receive autoclave training. Autoclave operating instructions should be posted in close proximity to the autoclave to ensure that infrequent users do not neglect proper operating techniques.