

Title: York University Biosafety Guideline: Biohazardous Waste Disposal.			
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The purpose of these guidelines is to ensure compliance with legislation related to the disposal of biohazardous waste.

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1. Definitions

Biohazardous waste may include any of the following:

- Biological agents such as bacteria, fungi, protozoa, parasites, viruses, prions, biologically-derived allergens/toxins, genetically-engineered protein or DNA products, with a real or potential ability to cause harm to humans, plants, animals, or the environment.
- Any material with the potential to harbour a biological agent, for example, human or animal blood/blood fractions, body fluids, and cell cultures.
- Any material contaminated with a biological agent including used items such as paper towels, gloves, disposable Petri dishes, culture tubes and other plastic containers.

Biomedical waste is defined under Guideline C-4: The Management of Biomedical Waste in Ontario. It includes any of the following:

- animal anatomical waste
- animal blood waste
- cytotoxic waste
- human anatomical waste
- human blood waste
- microbiological laboratory waste
- sharps waste
- waste that has come into contact with human blood waste that is infected or suspected of being infected with any infectious substance (human)
- waste containing or derived from one or more wastes described above



Figure 1: Universal Biohazard Symbol

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There are exceptions to this list, including domestic waste, treated biomedical waste, or animal anatomical or animal blood waste disposed according to other relevant legislation. Definitions for each type of biomedical waste stream are provided below.

Animal blood waste: waste related to an animal treated for an infectious substance (animal) and that is

1. liquid or semi-liquid animal blood or blood products
2. items saturated with liquid or semi-liquid blood products
3. body fluids visibly containing animal blood
4. body fluids removed in the course of surgery, treatment or necropsy of an animal, other than urine, feces, or milk unless visibly containing blood

Animal anatomical waste: waste related to an animal that is infected or suspected of being infected with any infectious substance (animal) and the waste is animal bedding, animal carcass, tissues, organs, or other body parts, other than teeth, nails, hair, feathers, hooves or horns.

Cytotoxic waste: waste consisting of (a) a cytotoxic drug or (b) a medicinal chemical, or waste containing (a) or (b) including waste that is tubing, tissues, needles, gloves, vials, preparation materials, ampoules, cleaning materials, and personal protective equipment.

Cytotoxic drug means a drug that was designed or selected for its capacity to selectively destroy cells of a certain type, including antineoplastic drugs and cancer drugs that selectively kill dividing cells.

Human anatomical waste means waste consisting of human tissues, organs or other parts, other than teeth, hair or nails.

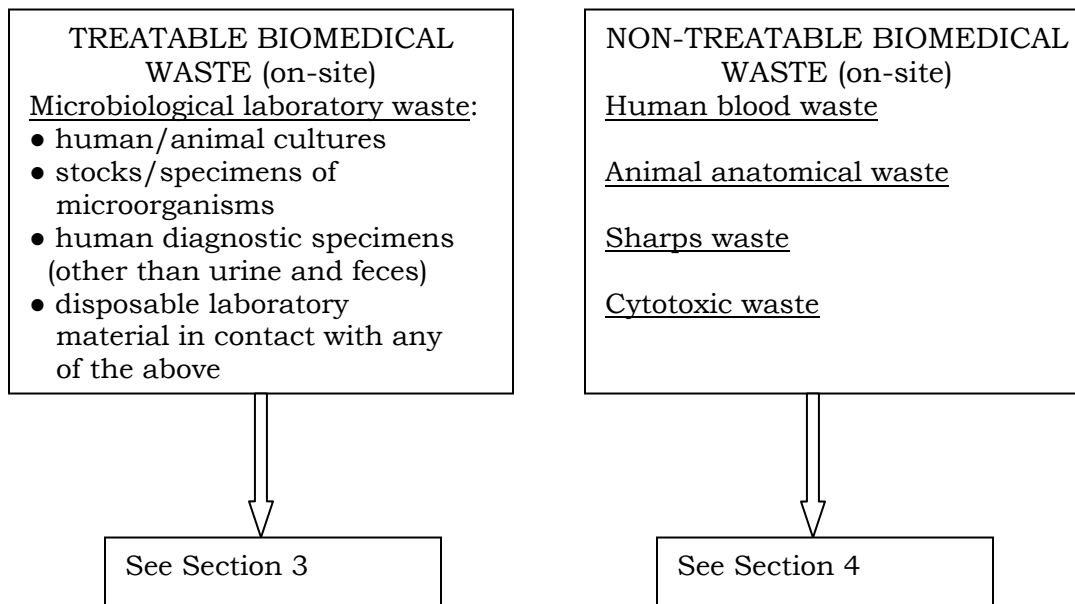
Human blood waste means waste consisting of liquid or semi-liquid human blood or blood products, items saturated with liquid or semi-liquid human blood or blood products, body fluids visibly containing human blood, or body fluids removed in the course of surgery, treatment or necropsy of a human, other than urine and feces unless visibly containing human blood.

Microbiological laboratory waste means waste containing human or animal cultures, stocks or specimens of micro-organisms, human diagnostic specimens, other than urine and feces, live or attenuated vaccines developed for use in humans, or disposable laboratory material that has come into contact with one or more of the items described.

NOTE: THE TERMS “BIOHAZARDOUS WASTE” AND “BIOMEDICAL WASTE” ARE USED INTERCHANGEABLY IN THIS DOCUMENT.

2. Biohazardous waste assessment

All biohazardous waste must be treated (ie. decontaminated/sterilized) at some point before disposal. Not all biohazardous waste can be treated at York, and must be done by a company specializing in transporting, treating, and disposing of this waste stream. It is therefore critical to know which biomedical waste streams can be treated on campus, and which biohazardous waste streams must be segregated and treated elsewhere. Below is a flowchart indicating the types of waste generated at York, and the relevant procedures to follow.



3. On-site treatment: microbiological laboratory waste

Microbiological laboratory waste is the only biomedical waste stream that can be treated at the university before disposal. Liquid waste is typically treated with bleach in the lab before disposal into the sanitary sewer. Solid waste is steam sterilized by any autoclave undergoing biological monitoring. NEVER put bleach-treated waste into an autoclave. It is also unnecessary to bleach waste that has been autoclaved.

If disposable laboratory material does not come into contact with any other microbiological waste described in Section 2 or any other hazardous materials, it is not hazardous waste. This can be disposed directly into a regular garbage bin within the lab. If uncertain, check with your supervisor before disposal.

3.1. Storage and labeling

Biohazardous waste must be stored in the waste generator's lab and labeled as a biohazard (Figure 1). This is important so that others, custodial staff in particular, are able to clearly distinguish it from other types of waste in the lab.

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Autoclavable bags or containers must be used to contain waste that will be autoclaved. Double-bagging is recommended for risk group 2 agents, waste with the potential to leak (ie. agar plates), or plastic pipette tips that could puncture the bag. Thicker autoclave bags are also available in Farquharson Stores.

Clear, unlabeled bags can be used, but must be placed in a labeled container (e.g. VWR cat#16211-134) at all times until after the waste has been autoclaved. Biohazard labels can also be obtained by contacting the biosafety officer.

Biohazard-labeled autoclave bags (e.g. VWR cat#14220-010, or Fisher cat#01-827B) can be used without labeled containers as long as the biohazard label is visible at all times. However, these bags must have all biohazard labels removed or completely defaced before disposal into the red “autoclaved waste” bins.

Liquid cultures that are treated in the labs with bleach should be labeled as “tissue culture waste + bleach” or “bacteria culture waste + bleach”.

3.2 Treatment using bleach and other chemicals

Many microorganisms can be destroyed by treatment with a minimum 1% (300-600ppm) final concentration of bleach for 30 minutes. Refer to the Public Health Agency of Canada (PHAC) MSDS, where possible. Always ensure effective sterilization for the biological agents used or suspected to be present.

Handle bleach, or any other hazardous chemical, in a chemical fume hood and wear the appropriate personal protective equipment (e.g. gloves, labcoat, and safety goggles). Never mix bleach with other chemicals including acids, organics, and chemicals containing ammonia. To do so could create chlorine or other noxious gases.

Place bleached culture waste in a chemical fumehood to minimize exposure to bleach fumes. Dispose into municipal waste drain with cold, running water.

3.3 Treatment using steam sterilization (autoclave)

Microbiological waste may be treated on-site provided the autoclaves used undergo biological monitoring. Biological monitoring is an indicator of sterilization efficacy and is done by using a spore test kit. The test result must indicate a reduction of *Bacillus stearothermophilus* spores within the waste by a level of 6 Log₁₀ (99.9999%). Testing is required every six operating days, and records of such tests kept for a minimum of two years. Treated waste should be stored separately from untreated biomedical waste and all other wastes. Therefore, place all autoclaved waste in the “autoclaved” waste bins located near the autoclaves. The Biology department currently performs these tests for the shared autoclaves in Lumbers and Farquharson, and makes test results available in the autoclave log books.

Do not use an autoclave to treat biohazardous waste unless regular spore tests are being conducted, and test results indicate no spore growth (ie. negative result).

Do not operate any autoclave without appropriate training.

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Appropriate training includes attending the York biosafety training course and hands-on training by a technician with experience in operating the specific autoclave(s) to be used.

For more information on autoclaving biohazardous waste at York, refer to the DOHS Autoclave training guidelines:

www.yorku.ca/dohs/documents/Autoclaves_Guidelines.pdf
www.yorku.ca/dohs/documents/Autoclaves_Guidelines.ppt

4. Non-treatable biomedical waste

Biomedical waste that cannot be treated will be segregated and held in a designated biomedical waste storage area for removal by a biomedical waste company. This is located beside Farquharson Stores (Room G 104). Keys for the room and freezer can be obtained from the storekeeper at Farquharson Stores. Access to the second biomedical waste walk-in fridge requires an access card available through the storekeeper.

Each lab is responsible for the waste they generate until it has been collected by Stericycle. All biomedical waste must therefore be labeled with name of the principal investigator (PI), lab location (building and room number), and lab extension.

4.1 Animal anatomical waste

Animal anatomical waste is collected in either red or yellow Stericycle biomedical waste bags. Bags are placed in Stericycle cardboard boxes that are labeled with a biohazard symbol, and a red “Anatomical” sticker (Figure 2). Waste is stored in the biomedical waste walk-in fridge until removed by Stericycle. Waste bags, boxes and stickers are available from Farquharson Stores.

Any formaldehyde or other preservative used must be decanted before disposal.

Animal bedding can be disposed in the regular waste provided it does not contain or is not suspected of containing an infectious agent. If the animal is suspected of containing an infectious agent, the bedding must be disposed as animal anatomical waste, described above.

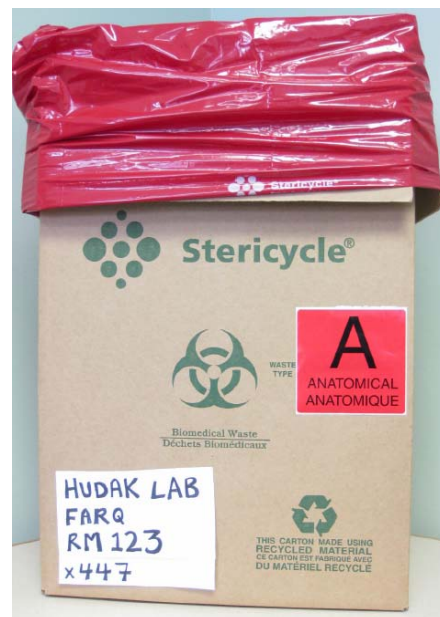


Figure 2: Anatomical Waste Packaging

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4.2 Human blood waste

Keep unused portions of human blood waste in the original collection vials, and dispose as sharps contaminated with biohazardous agents (Refer to section 4.3).

Human blood waste that is not suspected of being infected with any infectious substance (human) is still disposed of as non-treatable biomedical waste. However in some circumstances (ie. if a spill were to occur, or if contaminated containers are to be reused) adequate bleaching or autoclaving is acceptable (Refer to section 3).

4.3 Biohazardous sharps

Sharps (e.g. razor blades, needles, scalpels, blood collection vials, broken glass or other sharp objects contaminated with biohazards) are to be collected in a yellow puncture-proof container. Acceptable Sharps Containers include:

- Stericycle sharps containers available through Farquharson Stores (Figure 3).
- Any yellow CSA Z316.6-95 compliant sharps container

When the sharps container is full (ie. to the fill line) transfer it to the biomedical waste storage area. Sharps are placed in Stericycle cardboard boxes. The box must be lined with a yellow biomedical waste bag and stored in the biomedical waste walk-in fridge until it is removed by Stericycle. Waste bags, boxes and puncture-proof containers are available from Farquharson Stores.



Figure 3: Sharps container

Other sharps waste (e.g. sharps contaminated with hazardous chemicals or radioactive materials) will require different handling and disposal procedures. Contact DOHS (x55491) for more information.

4.4 Cytotoxic waste

Cytotoxic waste, including sharps, is collected in a red puncture-proof container with the proper labeling as shown in Figure 4. Cytotoxic waste must not be placed in the same container as biohazardous sharps waste. Cytotoxic waste containers can be made available through Farquharson Stores.



Figure 4: Cytotoxic Symbol

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5. Resources & References

Resources:

Debbie Kolozsvari, York University Biosafety Officer (BSO)
DOHS, East Office Building, Room C42, x44745, dkolozsv@yorku.ca
www.yorku.ca/dohs/biosafety

Farquharson Stores:

Monday-Friday	Storekeeper
8:30am-11am	Amal Youssef
11:15am-1pm	x30570
2pm-3pm	amal@yorku.ca
3:15pm-4:30pm	

Stericycle Pick-up Schedule:

Monthly pick-up time and dates available at Farquharson Stores

Public Health Agency of Canada MSDSs
www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/index-eng.php

References:

C-4 Guidelines: The Management of Biomedical Waste in Ontario
www.ene.gov.on.ca/environment/en/resources/STD01_075989.html

C-17 Guidelines: Non-Incineration Technologies for Treatment of Biomedical Waste
(Procedures for Microbiological Testing)
www.ene.gov.on.ca/environment/en/resources/STD01_075988.html

Regulation 347: Waste Management
www.e-laws.gov.on.ca/html/regs/english/elaws_regs_900347_e.htm

City of Toronto: Sewers By-Law
www.toronto.ca/legdocs/municode/1184_681.pdf

City of Toronto: Waste Collection, Commercial Properties
www.toronto.ca/legdocs/municode/1184_841.pdf

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