

NJIT

Biological Waste Management for Laboratories



NJIT Environmental Health and Safety Department
Spring, 2017

Biological Waste

- In broad terms, biological waste may be defined as:
 - liquid or solid waste contaminated with infectious or potentially infectious microorganisms
 - tissue culture
 - cell cultures
 - recombinant DNA
 - genetically engineered organisms, plants, or products regulated by the CDC, NIH, USDA/APHIS, or other State and local authorities.
- These materials may be classified by the biosafety level (BL) of the contaminant.
- NJIT laboratories only manipulate materials regulated at BL-1 and BL-2, no waste beyond BL-2 will be generated.
- In terms of hazard assessment, the NJIT Institutional Biosafety Committee considers all human derived materials (e.g., human blood and body fluids, primary human tissue explants and cell lines, as well as commercially obtained human cell lines) at BL-2 containment.
- Human derived material = BL-2.

Treatment and Disinfection of Biological Waste

The CDC/NIH Guidelines require that biological waste be decontaminated prior to disposal.

Typically, adequate disinfection may be achieved by employing either:

- physical means: typically taken to mean **autoclave** processing which employs a combination of time, temperature, and pressure to achieve disinfection; or
- chemical means: the application of a chemical disinfectant with the appropriate properties that, given the necessary contact time, adequate disinfection will be achieved.
 - Typically a concentration of **10% liquid chlorine bleach** (this is a 1:10 solution of liquid household chlorine bleach and water) in direct contact with the waste material for 20 to 30 minutes will be sufficient.
- Potentially contaminated biological waste items are accumulated in the laboratory in red or orange autoclave bags.
- When almost full, these bags are closed, placed in a spill or leak proof tray for transport to the autoclave, if autoclave is located outside the laboratory.
- Autoclave tape or other sterility indicator shall be used to demonstrate that the bag has been adequately disinfected by the autoclave process.
- Spill or leak proof trays made of Nalgene, or other autoclavable material, shall be used in the autoclave to contain any leaking material.

Regulated Medical Waste (RMW)

- Following adequate disinfection, biological waste will be placed into Regulated Medical Waste boxes, lined with red bags, that are supplied by the NJIT EHS Department.
- The **NJIT Medical Waste label** will be applied to all Medical Waste boxes, once the laboratory begins placing waste into the Medical Waste box.
- Once properly sealed, full Medical Waste boxes will be stored in a secure location (typically the laboratory) to await pick up by the EHS Department.
- EHS transports the full boxes of medical waste to a secure accumulation point to await pickup by the Medical Waste vendor.
- Alternatively, full boxes of Medical Waste may also be collected directly from the laboratory by the Medical Waste vendor.
- Medical Waste boxes must have proper labels supplied by the vendor and the NJIT Medical Waste label.
- At the end of the work shift, medical waste boxes must be closed.

Biological Waste Management, Solid Waste



Solid Waste



Collect in
Autoclave
Bags



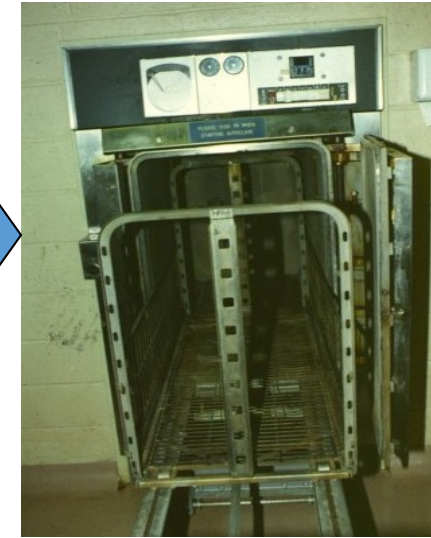
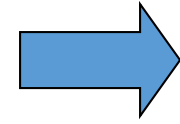
Sharps



Collect in Sharps
Containers



Apply
Indicator
Tape or
Strips and
Label



Autoclave

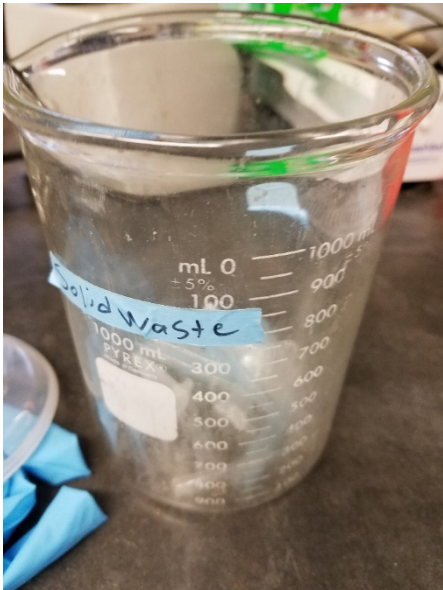
Biological Waste Management, Solid Waste

- Collect solid waste items inside the biological safety cabinet.
- Limit the number of times you remove your hands from the cabinet.
- This limits the disruption of the cabinet's air flow patterns.
- Remember to decontaminate your waste before placing it in the medical waste box.
- The following items require disinfection:
 - all BL-2 waste;
 - all recombinant materials;
 - any biological waste that may be potentially infectious (this includes many BL-1 organisms that are considered opportunistic pathogens); and
 - all human derived materials (primary or commercially obtained).
- These items must be decontaminated before they are removed from the cabinet and placed in the regulated medical waste box.

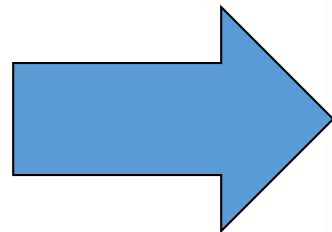


Biological Waste Management, Solid Waste

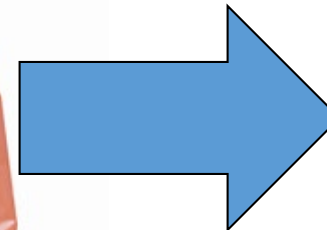
- Please do not collect potentially contaminated pipette tips, weigh boats, spatulas, and other miscellaneous items in a beaker on the bench and label as “waste”.
- This is a very common violation.
- Biological items may go in a variety of containers and be labeled with the NJIT Biological Waste Label or a container from the manufacturer that is pre labeled.
- Chemically contaminated solid waste items should be collected in a proper container with a lid and labeled with the appropriate chemical waste label.



Improper Container
Improper Label



Appropriate Container, Sealable,
Pre-Labeled



Appropriate Container, Pre-Labeled,
and closed with tight-fitting lid

Biological Waste Management - Liquid Waste



Chemical
Disinfection

OR

Physical
Disinfection



OR



Add household
liquid chlorine
bleach to achieve
10% of total
volume. Let
stand 30 minutes.

OR

Autoclave

Carefully drain
dispose with
plenty of water

Collect Liquid Waste

Avoid Autoclaving Flammable, Explosive,
or Potentially Harmful Chemicals

Biological Waste Management - Autoclave

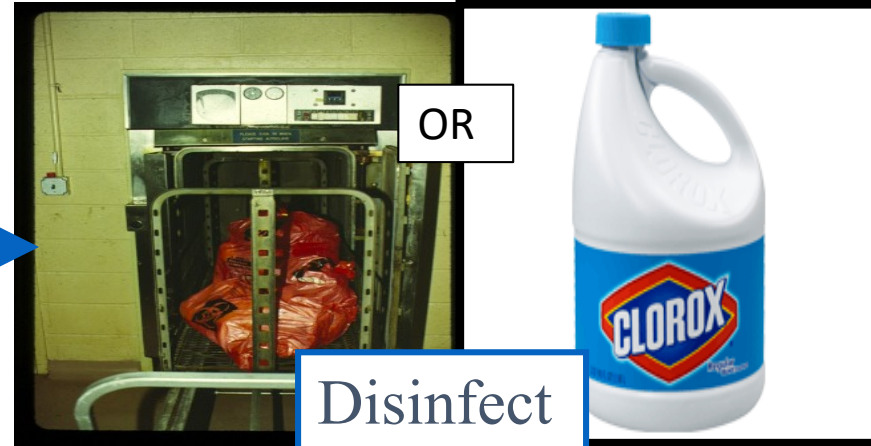


- Autoclaves exert temperature (heat/steam) and pressure to achieve decontamination over time. Typically 121° C at 15 lbs/in² for 60 minutes (complete cycle) are the preferred settings for waste decontamination.
- Once decontaminated waste bags are removed from the autoclave and packaged as Regulated Medical Waste.
- Sealed and labeled boxes of medical waste are collected by the EHS Department and sent for off-site incineration.

Biological Waste Management



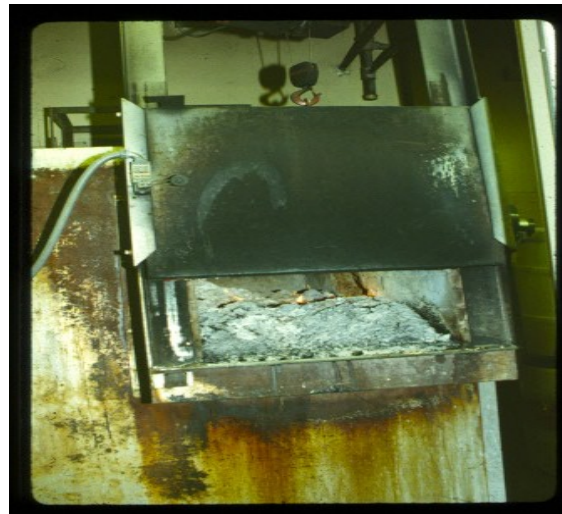
Collect



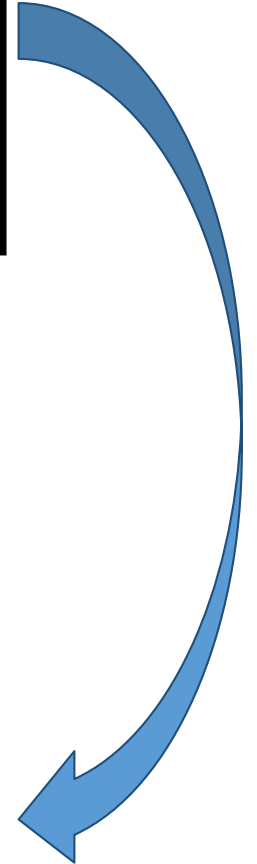
Disinfect



Package and Label as RMW



Off-Site Incineration



Biological Waste Management - Labeling

Biological-Medical Waste

NJIT
New Jersey's Science & Technology University

Waste Removal Date _____ EHS USE ONLY

Principal Investigator _____ Telephone # _____
Lab Manager _____ Email _____
Building _____ Room # _____

University Heights, Newark, NJ 07102

Biological-Medical Waste

NJIT
New Jersey's Science & Technology University

Waste Removal Date _____ EHS USE ONLY

Principal Investigator _____ Telephone # _____
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University Heights, Newark, NJ 07102

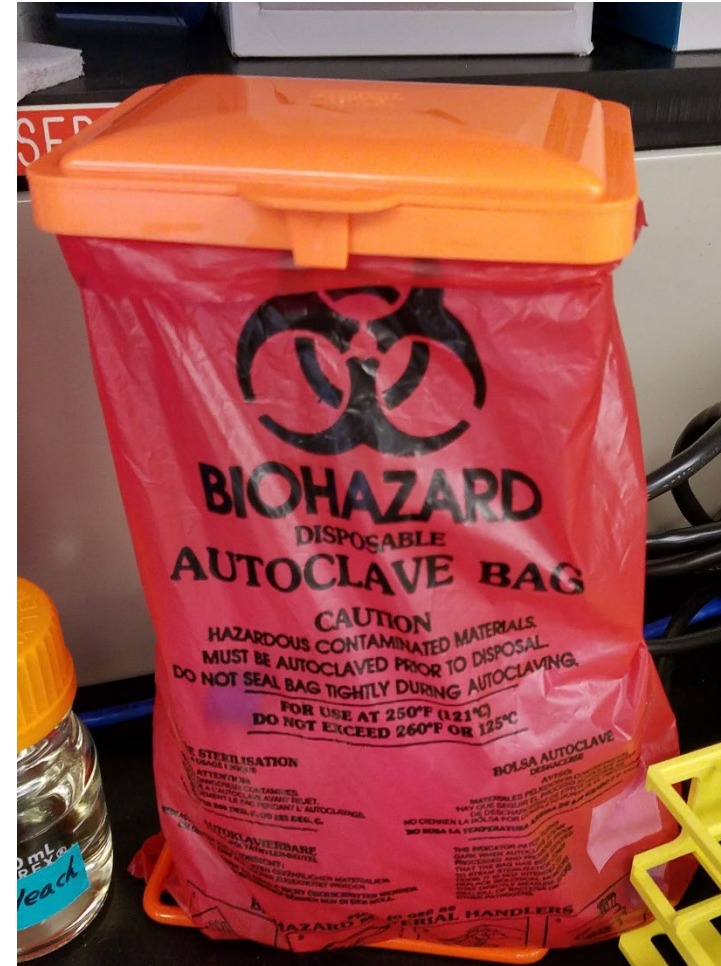
Sharps containers and other items that are placed inside the RMW box are labeled with the inner container label



The Regulated Medical Waste (RMW) box itself is labeled with the Outer Container Label.



Biological Waste Management








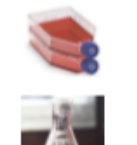




Containers of medical waste must be closed when not in use and at the end of the work shift – containers may not be left open in an unattended laboratory or overnight.

Small and large lids are available from EHS upon request

The NJIT Biological Waste Disposal Diagram may be found on the EHS website under Waste Management



Waste Type	Sharps/tubing	Contaminated glass and plastic labware	Solid waste	Liquid waste
Waste Type and Examples				
Waste Type and Examples	Razor blades, scalpels, syringes, specimen tubes, contaminated broken glass, Pasteur pipettes, broken microscope slides	Contaminated flasks, cylinders, beakers, vials, bottles	Culture dishes, petri dishes, tissues, cells, gloves, masks, and other solid contaminated items	Human blood or body fluids, liquid growth media, animal blood, recombinant DNA waste
Container	 Red Sharps Container			
Decontamination	Prior to placing in the Medical Waste box, full sharps containers contaminated with BL-2 material should be decontaminated by autoclaving or by chemical disinfection with 10% liquid chlorine bleach. Place in Regulated Medical Waste box or Contact EHS for Disposal.	Prior to drain disposal, liquid waste must be decontaminated with 10% liquid chlorine bleach solution, then carefully poured down the drain. Rinse with fresh water. Disposable empty containers may then be handled as solid waste.	Prior to placing in the Regulated Medical Waste box, Biosafety Level 2 waste must be decontaminated. Decontaminate with fresh 10% bleach soln. allow at least 20 minutes contact time OR Autoclave. Contact EHS for disposal.	Prior to drain disposal, liquid waste must be decontaminated with 10% liquid chlorine bleach solution, allowing at least 20 minutes of contact, then carefully poured down the drain. Rinse with fresh water. Empty containers may then be handled as solid waste OR autoclaved.
Disposal		Drain Disposal. Reuse or dispose as solid waste.		Drain Disposal.
Labeling	Apply the Biological-Medical Waste label to the waste container when you begin to fill it. Please do not label empty containers. Fill the label out completely. Please complete all necessary information including laboratory contact information. The inner label is dated when EHS is contacted to remove the waste. Please apply the inner label to sharps containers and other containers that are placed in the RMW box. The outer label goes on the outside of the RMW box. Example:			



NJIT WASTE REMOVAL REQUEST FORM

Lab Contact Information	Submittal Date: _____
Building: _____ Room: _____ Principal Investigator/Faculty: _____ Contact Information: _____	This date reflects the date waste was submitted to EHS for hazardous waste determination. This date does not represent the end of waste accumulation.
Special Instructions:	FOR EHS USE ONLY:

Waste **will not** be removed unless the following requirements are met:

- Every waste container should have a NJIT waste label with all contents listed. Every item including water, solvents, and solid waste should be included on waste label.
- All waste container should be closed, sealed and in good condition.
- The waste labels are to be filled out completely including lab contact information, full name of all the chemical components and the approximate percentage of each substance if known
- If known, concentration percentages of each substance should equal 100%.
- Waste should be stored in designated waste storage area/s only.

Type of Waste						
	Chemical	Biological/Medical	Radiological	Acutely Hazardous ¹		
#	Container Type:	Quantity/Size:	State of Contents:	Location of Waste:	Contents:	Hazard Type:
EX.	Plastic	1/ 1 pint	Liquid	Under Fume Hood	Methanol, Water	Flammable
	(See NJIT Container Request Form)		(Solid/ Liquid)	(Please be specific)	(Please be specific)	
1						
2						










¹ <https://www5.njit.edu/environmentalsafety/sites/environmentalsafety/files/Acutely%20Hazardous%20Waste%20%28SP-Codes%29.pdf>

NJIT WASTE CONTAINER REQUEST FORM

Lab Contact Information	Submittal Date: _____
Building: _____ Room: _____ Principal Investigator/Faculty: _____ Contact Phone #: _____	This date reflects waste was submitted to EHS for hazardous waste determination. This date does not represent the end of waste accumulation.
Special Instructions:	FOR EHS USE ONLY:

Waste Container Request Guidelines

Please check all that apply. Indicate Size and Quantity needed. Ensure all containers requested are compatible with the waste materials being generated.
Example: Corrosive Materials should not be stored in Steel drums regardless of concentration.
Example: Liquids should never be stored in Fiber drums.

Plastic	Plastic	Plastic	Plastic	Steel	Plastic	Fiber Lined	Plastic	Fiber
								
Size/Quantity 1 Pint Quantity Requested	Size/Quantity 1 Gallon Quantity Requested	Size/Quantity 5 Gallon Quantity Requested	Size/Quantity 30 Gallon Quantity Requested	Size/Quantity 30 Gallon Quantity Requested	Type/Quantity 30 Gallon Quantity Requested	Quantity Requested	Size/Quantity Small Quantity Requested	Size/Quantity 15 Gallon Quantity Requested
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contents:	Contents: SOLIDS ONLY	Contents:	Contents:	Contents:	Contents:	Contents: SOLIDS ONLY	Contents: SOLIDS ONLY	Contents: SOLIDS ONLY

Please enter desired quantity of labels below:

- As with chemical waste, use the Waste Removal Request Form and Waste Container Request Form to facilitate the removal of biological waste from your lab and the delivery of replacement containers and labels.
- These forms are found on the EHS website: <https://www5.njit.edu/environmentalsafety/ehs-forms/>

Questions?

Contact EHS with questions concerning biologicals waste management in your lab.

**NJIT Environmental Health and Safety (EHS)
Department**

Contact Us:

<https://www5.njit.edu/environmentalsafety/>

973-596-3059

healthandsafety@njit.edu