 NUS Department of Medicine National University of Singapore	Doc. No:	SOP-Medicine-02
	Standard Operating Procedure	
Title: Biological Waste Disposal	Ver No	004
	Page:	1 of 4
Prepared By Seet Bee Leng / Adeline Chow	Approved By Prof Anantharaman Vathsala	Issue Date 15-04-2022

1. OBJECTIVE

This standard operating procedure outlines the process in which biological wastes generated in the research laboratories of Department of Medicine located at MD1, MD6 and NUH, are to be treated and disposed of in a safe and environmentally sound manner.

2. SCOPE

This biological waste disposal procedure is applicable to all staff and students and details how the biological waste are to be treated and transported from the laboratory to the Biohazardous Waste Room.

3. RESPONSIBILITIES AND ACCOUNTABILITY

- 3.1 The principal investigator is to provide on-the-job training for all laboratory staff and students for the safe disposal of biological waste and ensure that they abide by the guidelines established in accordance to the applicable environmental legislations. The principal investigator shall also ensure that all wastes are segregated and stored at the designated storage areas and maintain good housekeeping for all biological wastes stored in the common area under his/her jurisdiction.
- 3.2 Staff and students working with biological materials must be aware of potential hazards, obtain proper training on biological waste disposal and must be knowledgeable of this SOP.
- 3.3 YLLSOM Research Facilities Management (RFM) team is responsible for liaising with the licensed waste service contractor, on the relevant waste disposal requirements of MD1 and MD6 building. In the NUH UMC satellite and GTR lab, NUH housekeeping dept is responsible for liaising with the licensed waste service contractor.


4. BIOLOGICAL SAFETY TRAINING

All individuals handling biological waste are required to complete the relevant safety training: Biosafety for BSL-1 Laboratories (OSHBIO07) or Biosafety for BSL-2 Laboratories (OSHBIO08) and Safe Handling of Human Tissue and Fluids (OSHBIO03) via LumiNUS.

5. PROCEDURE

5.1 Safety Precautions

- a. Wear proper personnel protective equipment including long sleeved lab coat, latex gloves, safety glasses and covered toe shoes when handling biological waste.
- b. Biohazardous wastes shall be identified and segregated according to the treatment or disposal method required.


 NUS Department of Medicine Standard Operating Procedure Title: Biological Waste Disposal	Doc. No:	SOP-Medicine-02
	Ver No	004
	Page:	2 of 4

	Classification	Examples
1	Sharps	Blood-drawing equipment, needles, syringes, slides, glass pipettes, capillary tubes, broken glass and scalpel blades.
2	Autoclavable wastes	All laboratory specimens or materials consisting of, containing, or contaminated with blood, plasma, serum, urine, faeces or other human or animal tissues or fluids, as well as inoculated media, cultures, contaminated paper wastes such as wrappers and towels and other potentially infectious materials
3	Wastes for incineration or cremation	Animal carcasses, solid human tissues, organs, etc.
4	Chemically contaminated wastes	Biohazardous waste contaminated with chemical agents (e.g. DMSO, EtBr or EtBR alternatives such as SyBr Green, Gel Red etc.)

- c. Biohazardous wastes shall not be disposed as general waste.
- d. Solid biohazardous wastes shall be double bagged in yellow biohazard bags.
- e. All biohazardous waste generated within the biosafety cabinet shall be decontaminated and/ or bagged within the cabinet prior to removing it from the cabinet for disposal.
- f. Any biohazardous waste outside the biosafety cabinet shall be contained in leak-proof containers with lids to prevent biohazard exposure.
- g. Biohazardous waste containers shall be clearly labeled as waste with the biohazard symbol.
- h. Solid biohazardous waste shall be sent to licensed biohazardous waste collectors for incineration.
- i. Liquid biohazard waste shall be decontaminated prior to disposal.
- j. Sharps shall be disposed into sharps containers.
- k. Biohazardous waste contaminated with chemical agents/radiation shall be discarded as chemical/radiation waste and disposed through licensed toxic industrial waste (TIW) collectors.

5.2 Biohazardous Waste Disposal

- a. All wastes containing biohazardous material should be handled with gloves and placed in double yellow plastic bag with biohazard sign printed on it. Indicate name of principal investigator, laboratory location, date of disposal and contact number on each waste bag.
- b. In MD1 and MD6 labs, the double yellow biohazard bags must be disposed in the 240L Biohazard Bin provided by the licensed waste collection company. When the bin is filled up, fasten strap buckle before transporting to the Biohazardous Waste Room.
- c. Use cargo/service lifts for bin transportation on a twice weekly basis.
 For MD6: Mondays and Thursdays between 9:00 am and 10:30 am, except for public holidays. (Located at MD6 Basement 1)
 For MD1: Mondays and Thursdays between 9:00 am and 10:30 am, except for public holidays. (Located at MD1 Level 3)
 Scan the QR code located in the Biohazardous Waste Room to submit the type and quantity of waste disposed. Exchange the full biohazard bins with the empty bins, and transport back to the laboratory using the cargo/service lift. The bins are then collected by a licensed contractor arranged by YLLSOM Research Facility

 NUS Department of Medicine <small>National University of Singapore</small>	Doc. No:	SOP-Medicine-02
	Standard Operating Procedure	
	Ver No	004
Title: Biological Waste Disposal	Page:	3 of 4

Management (RFM) team. For further enquires please contact RFM at medbox50@nus.edu.sg.

- d. In the NUH labs, the double yellow biohazard bags are collected from the laboratory by the NUH housekeeping dept and disposed via their appointed licensed waste collectors.
- e. Liquid biohazardous wastes should be decontaminated with the use of an appropriate chemical disinfectant (e.g. presept solution).

5.3 Sharp Waste Disposal

- a. Biologically contaminated sharps are to be handled separately and differently from the ordinary trash.
- b. All contaminated sharps include blood-drawing needles, syringes, slides, broken glass and scalpel blades. Contaminated needles shall not be recapped or separated from syringes prior to disposal.
- c. Sharps containers should be impervious, rigid and puncture proof.
- d. Filled sharps containers should be sealed once they reach the $\frac{3}{4}$ full mark and disposed of through the licensed biohazardous waste contractor.

5.4 Cytotoxic Waste Disposal

- a. Cytotoxic solid waste (Ethidium Bromide or Safeview Gel) should be collected in the bucket labeled 'Cytotoxic Waste' with proper double purple bags.
- b. Cytotoxic liquid wastes are collected in carboys container provided by YLLSOM RFM team with 'Cytotoxic Waste' labeled. The carboys is placed in a secondary container.
- c. Cytotoxic waste should not be disposed in yellow biohazard bags as they are incinerated in different temperatures at the waste disposal company.
- d. Both cytotoxic solid and liquid wastes are to be collected by the licensed waste contractor arranged by YLLSOM RFM team similar to the biohazardous waste disposal workflow (refer to 5.2.c)

5.5 Non Infectious and Environmentally Benign Waste

Materials that can be directly discarded into the sewer include nutrient fluids, tissue culture, uninoculated medium, serum, blood, plasma and tissue culture provided these specimens have been chemically decontaminated and the chemical is not prohibited from discharge into the sewer.


6. ACCIDENTS AND INCIDENTS REPORTING

Accidents resulting in injuries or spill incidents must be reported to the Principal Investigator and/or laboratory safety lead immediately after first aid is applied.

Seek medical attention when necessary at the University Health Centre or proceed to the Accident & Emergency units of National University Hospital after office hours.

All incidents or accidents have to be notified to OSHE within 24 hours via the online NUS Accident and Incident Management System (AIMS)

@https://inetapps.nus.edu.sg/osh/portal/eServices/ehs360_aims.html. The AIMS report can be submitted by the injured staff/student, safety leads, his or her supervisor/representative if the staff or student is unfit/unable to do the initial report.

 NUS Department of Medicine <small>National University of Singapore</small>	Doc. No:	SOP-Medicine-02	
	Standard Operating Procedure		
	Ver No	004	
Title: Biological Waste Disposal		Page:	4 of 4

7. REFERENCE

NUS Laboratory Biorisk Management Manual (NUS/OSHE/M/01)

8. REVISION HISTORY

Date Revised	Version No.	Author	Summary of Revisions
06-03-2016	001	Seet Bee Leng / Yeo Soh Bee	
01-10-2016	002	Seet Bee Leng / Yeo Soh Bee	Section 6: Revised Accident and Incident Reporting System (AIRS) to Accident and Incident Management System (AIMS)
15-04-2019	003	Seet Bee Leng / Yeo Soh Bee	Section 4: Replaced Biological Safety with Biosafety for BSL-2 Laboratories” Section 5.1: Edited Safety Precautions based on the new OSHE Biorisk manual (NUS/OSHE/M/01)
15-04-2022	004	Seet Bee Leng/ Adeline Chow	Section 3: Updated 3.3 Responsibilities and Accountability Section 4: Updated to LumiNUS training Section 5: Workflow for biohazardous waste disposal in MD1 and MD6.