

LABORATORY SERVICES PONDICHERRY INSTITUTE OF MEDICAL SCIENCES	SAFETY MANUAL	DOCUMENT NO: PIMS / SM / H
	MANAGEMENT OF BIOMEDICAL WASTE	

Purpose: To define the guidelines for segregation, handling, storage, transportation and disposal of various kinds of biomedical waste generated in the laboratory premises. To categorize the lab generated waste, based on its type and management of waste until disposal, in accordance with the regulations of the State Pollution Control Board.

ISO 15189 clause: 5.7.2

Scope: To all waste generated in the laboratory premises.

Responsibility

- **Primary:** Sectional HOD
- **Secondary:** Safety officer, Dy. QM

1. Introduction:

In the laboratory both hazardous and non-hazardous waste is generated. This waste, if not managed properly, increases the risk of injuries, infection and exposure to harmful toxins. The most common problems include lack of awareness about health hazards related to health care waste (HCW), inadequate training in correctly managing waste, absence of waste management and disposal systems, insufficient financial and human resources and the low priority given to the issue.

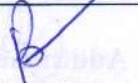

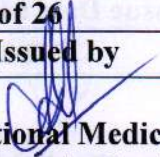
Bio-medical waste means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological, and including categories mentioned in Table 1.

2. Objectives:

- Define and implement an effective system to provide for the sound and safe management of laboratory generated waste.
- Provide direction to laboratory staff for waste classification, storage, segregation, transportation, treatment and disposal.

3. Classification of waste in the Laboratory Service:

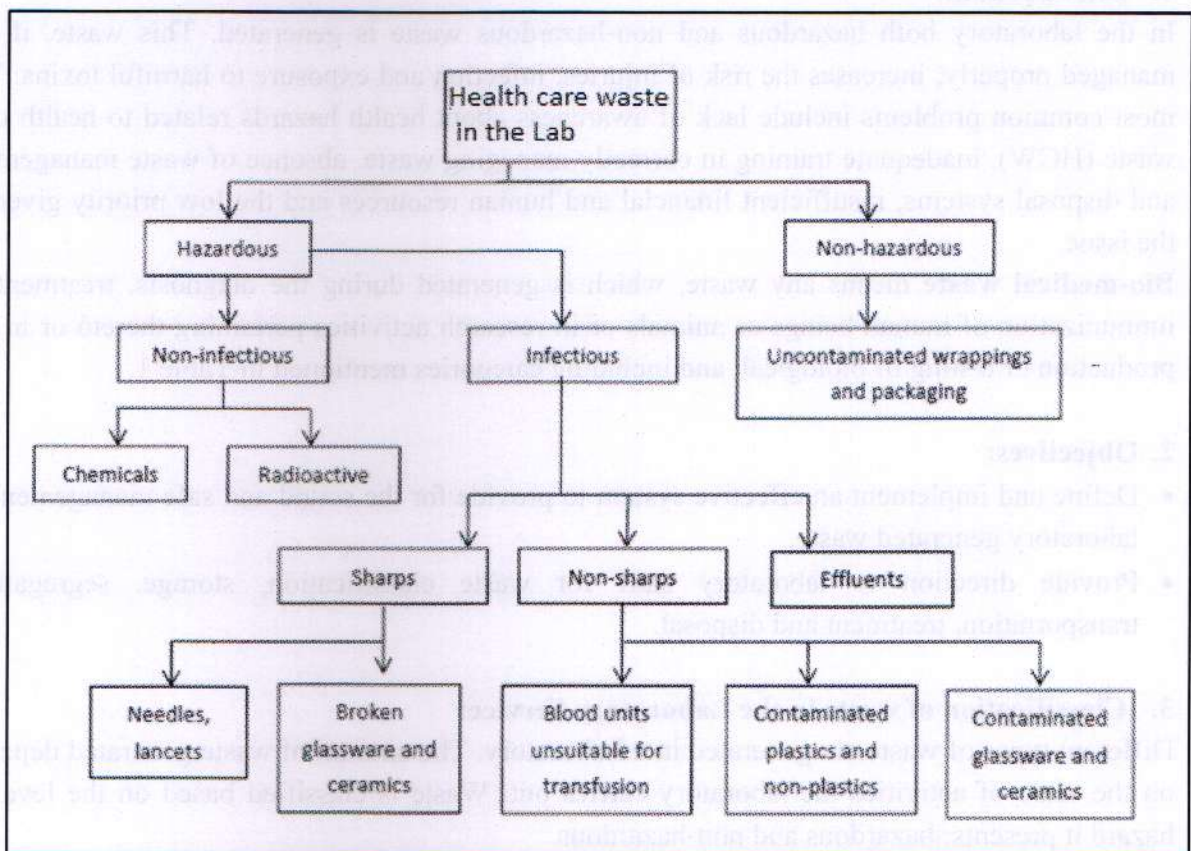
Different types of waste are generated in a Laboratory. The amount of waste generated depends on the scale of activities the laboratory carries out. Waste is classified based on the level of hazard it presents; hazardous and non-hazardous.



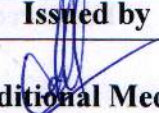
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Hazardous waste is any waste that poses a substantial or potential threat to human health or the environment. About 15-25% of HCW generated in the hospital facility falls into this category.

Infectious waste is any used contaminated, soiled or discarded material, device or equipment that has the potential to transmit infectious agents. This includes sharps, non-sharps and effluents. Any material contaminated with blood should to be considered potentially infectious and should be handled according to standard precautions.

Non hazardous waste is that not contaminated with blood or other body fluids, or chemicals. About 75-85% of waste generated is non-hazardous and includes items such as packaging, boxes and wrappings.



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4. Waste Management Process in the laboratory Service:

Handling of HCW generated in a lab poses a risk of infection; therefore, quality managers and safety managers should:

- Assess the risks posed by HCW and provide a safe working environment for staff.
- Ensure that staff members are aware of the need to manage HCW appropriately, and are properly trained and supervised.
- Provide staff with adequate equipment and appropriate protective personal equipment (PPE), based on the anticipated risk involved in the handling process.
- Develop guidelines and standard operating procedures for managing HCW that meet the requirements for infection control and occupational health and safety.



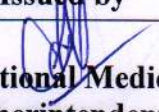
The process of dealing with HCW consists of the following steps:

- Waste minimization
- Waste segregation
- Waste collection
- Waste storage
- Waste transportation
- Waste treatment
- Waste disposal

Waste minimization to be achieved through reduction, Re-use and Recycling.



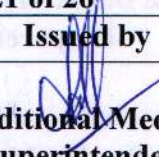
Categories of Biomedical waste. (Based on Bio- Medical Waste Management Rules, 2016)

Type of Waste	Type of container/ bag or to be used	Treatment and Disposal options	#Interpretation
a) Human Anatomical Waste: Human tissues, organs, body parts and fetus below the viability period, dead fetus waste- to be handed over to CBWTF along with the necessary legal documents	Yellow bag, non-chlorinated plastic bags	Incineration / Plasma Pyrolysis / deep burial	No Pre-treatment required
b) Soiled Waste: Items contaminated with blood, body fluids like plaster casts, dressings, cotton swabs and bags containing residual or discarded blood and blood components.		Incineration / Plasma Pyrolysis / deep burial. OR Autoclaving / micro-waving /	” Except Blood bags - to be autoclaved

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c) Chemical Liquid Waste: Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, discarded formalin, infected secretions, aspirated body fluids, liquid from laboratories, and floor washings, cleaning, housekeeping and disinfecting activities etc.		hydroclaving followed by shredding Separate collection system leading to effluent treatment system	The chemical liquid waste to be pre-treated before mixing with other wastewater.
Clinical laboratory waste (Blood bags, Laboratory cultures, stocks or specimens of microorganisms, live or attenuated vaccines, human & animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.)	Autoclave safe Red plastic bags or containers	Pre-treat to sterilize with non-chlorinated chemicals on-site (as per NACO or WHO guidelines). Thereafter for incineration	To be put in a Autoclave Safe Bag of any Color, Autoclaved & then put in a Yellow Bag and handed over to the operator of common BMW treatment facility.
Contaminated Waste (Recyclable) Wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and fixed needle syringes and vacutainers) and gloves.	Red colored non-chlorinated plastic bags or containers	All vacutainers will be autoclaved and sent to CBWTF for shredding / mutilation / combination of sterilization and shredding.	No shredding / mutilation needed.
Waste sharps including Metals: Needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades, or any other	Puncture proof, leak proof, tamper proof containers	Autoclaving or dry heat Sterilization followed by	No Pre-treatment, shredding/ mutilation required


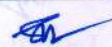
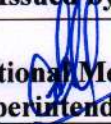
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contaminated sharp object that may cause puncture and cuts. This includes both used, discarded and contaminated metal sharps.		shredding or mutilation or encapsulation in metal container or cement concrete	
a) Glassware: Broken or discarded and contaminated glass including medicine vials and ampoules	Puncture proof, leak proof boxes with blue colored marking	Disinfection (by soaking the washed glass waste after cleaning with detergent and 1% Sodium Hypochlorite treatment) or through autoclaving or microwaving or hydroclaving and then sent for recycling.	No Pre-treatment, required

Waste segregation and transportation:

- Segregation responsibility lies with the doctors, nurses, technicians
- Transportation is the responsibility of the house keeping staff.
- Collect and segregate waste at the site of generation.
- Use different kinds of clearly identifiable color-coded waste containers to separately collect sharps, infectious and non-hazardous waste.
- Strong leak-proof and puncture-proof containers with lids to be used for sharps.
- Red for (recyclable) contaminated waste - gloves, syringes, blood collection tubes. 
- Yellow for infectious waste – human tissues, blood soaked cotton 
- Puncture proof, leak proof **blue** containers with biohazard symbol for glass – vials. Ampoules, test tubes, slides. 
- Puncture proof, leak proof containers for sharps including metals e.g. Needles, syringes with fixed needles, scalpels, blades, discarded and contaminated metal sharps. 

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- Green bin (without biohazard symbol) for food waste ■
- Blue bin (without biohazard symbol) for general waste (E.g. paper, disposable cups, aluminium foils ■)

* In case a bin of the same color is not available, a neutral color bin may be used with appropriate color coded bag.

Waste collection:

- Waste to be collected regularly (on a daily basis) by trained and designated staff.
- Do not over-fill the waste bins and seal them securely.
- Replace the containers for waste immediately with new ones of the same type.
- The containers for collection should be strategically located at all points of generation.
- At shift end, garbage from every floor is transported to central waste collection area.



PONDICHERRY INSTITUTE OF MEDICAL SCIENCES

SEGREGATION OF BIO-MEDICAL WASTE





**RED COVERED BIN
(INFECTED PLASTICS)**
Gloves, syringes, IV sets, Venflons, Urinary catheters, Urobags, Suction catheters, Drain tubings, Plastic IV bottles, Vacutainer tubes, Plastic aprons





**YELLOW COVERED BIN
(INFECTED NON-PLASTICS)**
Human & animal tissue, Soiled waste like cotton, gauze, plaster casts, bandages & dressings, Contaminated fabric caps, masks & shoe covers, Linen items, Expired drugs, Cytotoxic waste along with glass/plastic containers








**BLUE PUNCTURE & LEAK PROOF BIN
(GLASS & METALS)**
Vials, Ampoules, Test tubes, Slides, Glass bottles, Metallic body implants





**WHITE PUNCTURE & LEAK PROOF CONTAINER
(SHARPS & SHARP METALS)**
Scalpel & shaving blades, Needles, Stylets, Lancets, Vacutainer needles, Syringes with fixed needles, Sharp metals like guidewires

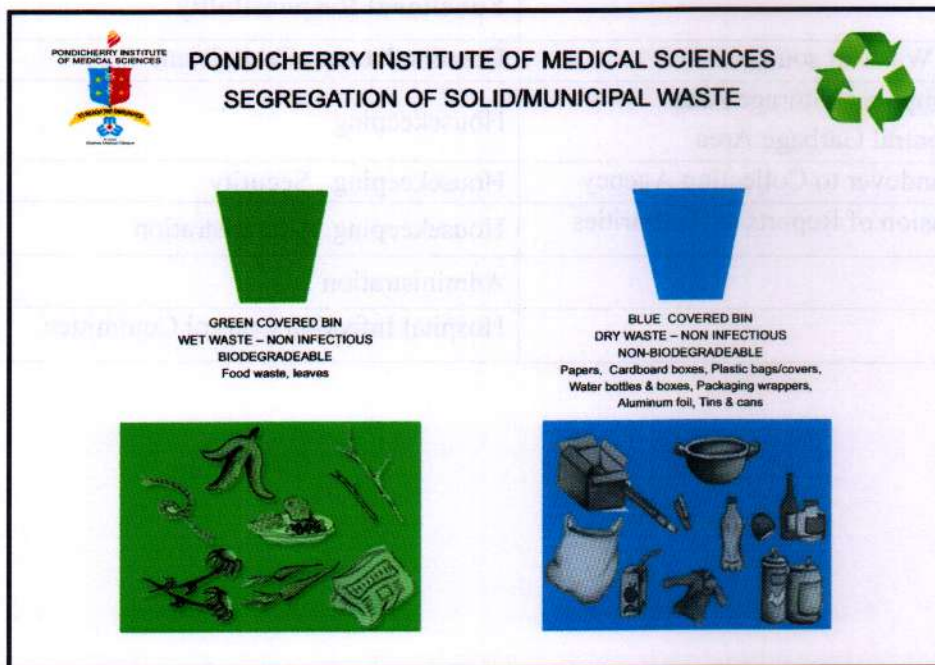


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

Waste storage:

- Responsibility lies with the departments of house-keeping and security.
- Untreated human anatomical waste, animal anatomical waste, soiled waste and, biotechnology waste shall not be stored beyond a period of forty eight hours.
- If it becomes necessary to store such waste beyond the stipulated period, appropriate measures to be taken to ensure that the waste does not adversely affect human health and the environment and the prescribed authority need to be informed, with justification.



Waste Treatment:

- Infectious waste is ultimately sent to the incinerator and no pre-treatment is necessary.
- Chemical Liquid Waste: Ideally to a separate collection system leading to effluent / sewage treatment system
- Microbiology, Biotechnology and other clinical laboratory waste: To be put in a dustbin cover bag (any Color), Autoclaved & then put in a Yellow Bag and handed over to the operator of common Bio-medical Waste treatment facility.

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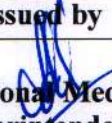
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Waste disposal:

- PIMS management has an agreement with the Pondicherry Solidwaste Management Company Pvt Ltd for the final disposal of the waste.

To summarize the HCW management and the personnel responsible

Process	Functional Responsibility
Segregation of Waste at source	Doctors, Nurses, Technicians
Transport to temporary Storage Area Transport to Central Garbage Area	Housekeeping
Storage and Handover to Collecting Agency	Housekeeping , Security
Timely Submission of Reports to Authorities	Housekeeping, Administration
Licensing	Administration
Oversight	Hospital Infection Control Committee

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