अखिल भारतीय आयुर्विज्ञान संस्थान (एम्स), गुवाहाटी
All India Institute of Medical Sciences, Guwahati.
स्वास्थ्य और परिवार कल्याण मंत्रालय,भारत सरकार के तत्वावधान में एक वैधानिक निकाय
(A statutory body under the aegis of Ministry of Health and Family Welfare, GoI)

BIOMEDICAL WASTE MANAGEMENT MANUAL, AIIMS GUWAHATI

1st Edition, 2024
Department of Hospital Administration
AIIMS, GUWAHATI
CHANGSARI, GUWAHATI-781101

Director's Message

That AIIMS, Guwahati has been established under PMSSY, MoH&FW with the aim of correcting regional imbalances in quality tertiary level healthcare services. The institute is having 750 sanctioned beds situated in the Kamrup (rural) district of Assam in a natural environment and we are committed to provide health care services without doing any harm to the natural environment by following all the environment protection norms. It is a common concept that no harmful substance should come out from the hospital premises in the form of air, water, and noise pollution and AIIMS, Guwahati has taken all necessary steps as per available rules & regulations framed by various ministries of Government of India and State Government of Assam for its implementation. That AIIMS, Guwahatiis also promoting "Clean & Green Hospital" concept by conducting regular plantation drives on all important occasions within the campus.

It gives me immense satisfaction that the 'Manual on Bio-Medical Waste Management for AIIMS, Guwahati' has finally come out with dedication and efforts by Department of Hospital Administration. It is a complete book covering all aspects of Biomedical Waste Management Rules 2016 and its amendments thereof. This 'Manual on Bio-Medical Waste Management for AIIMS, Guwahati', will help all healthcare staff to strengthen their knowledge on Biomedical Waste Management and also will act as a training material for them. The healthcare staff can understand and practice easily the relevant steps of Biomedical Waste Management like segregation, collection, storage, transportation as well as disposal.

I am delighted by the pictorial demonstration in the manual and its easy language.

Prof. Ashok Puranik
Executive Director
AIIMS, Guwahati

डॉ. अशोक पुराणिक / Dr. Ashok Puranik
कार्यकारी निदेशक / Executive Director
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From the Desk of the Medical Superintendent:

Improper management of biomedical waste generated in health facilities causes adverse impact on the health of the patients, their caregivers, the health workers, the community and the environment. The "Biomedical waste management manual, AIIMS, Guwahati" provides a comprehensive and step-by-step guide for training and facility-level implementation of an effective biomedical waste management system. The contents in this manual are well organized and touch upon all relevant aspects of biomedical waste management at healthcare facilities like management of biomedical waste in the hospital, management of biomedical waste at the outreach camp, bar coding system, occupational safety of staff, annual health check-up of staff, authorization process, submission of annual reports and most importantly the dos and don'ts.

This manual has also incorporated the format for biomedical waste register, log book for autoclave, accident reporting etc.

This manual has come out in the perfect time and I am confident that it will be instrumental for all cadres of staff in the hospital for capacity building.

Dr. Neizekhotuo Brian Shunyu
Medical Superintendent
AIIMS, Guwahati

Acknowledgement

The "Biomedical Waste Management Manual, AIIMS, Guwahati" will remain incomplete without expressing gratitude to the contributors of this manual. I sincerely expressed by heartfelt thanks and gratitude to all staff who have made implementation of the biomedical waste management rules possible in the hospital. The Executive Director, AIIMS, Guwahati with his commitment for clean and green hospital and his vision for standard practice in the hospital has initiated the idea of this manual. He emphasized the importance of proper management of biomedical waste generated in the hospital with regular training and awareness program. All staff posted in the patient care services must be aware of the biomedical waste management rule 2016 and its amendments thereafter for its proper implementation. Thus, we are grateful to him for conceptualising the idea of having a biomedical waste management manual for AIIMS, Guwahati. Heartfelt gratitude for Medical Superintendent, AIIMS, Guwahati who has always been there for providing guidance at all stages while framing of this manual. Gratitude is also expressed to Prof. Bhupen Barman, Dr. Jaya Shankar Kaushik, Dr. Kaustav Bairagi, and Dr. Deepjyoti Kalita for their constant support and guidance while drafting the manual. Nevertheless, the contributions of hospital infection control team, housekeeping supervisors and Mr. Lalit Kumar of AIIMS, Guwahati have been instrumental for the effective implementation of biomedical waste management rules in the hospital.

Dr. Biraj Chandra Paul
Assistant Professor
Hospital Administration, AIIMS, Guwahati

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LIST OF ABBREVIATIONS:

AERB- Atomic Energy Regulatory Board

AIIMS- All India Institute of Medical Sciences

APCB- Assam Pollution Control Board

BMW- Biomedical Waste

CBWTF- Common Biomedical Waste Treatment Facility

CPCB- Central Pollution Control Board

EEE- electrical and electronic equipment

ETP- Effluent Treatment Plant

E-Waste- Electronic Waste

FA- Financial Advisor

HCF- Health Care Facility

MoEF- Ministry of Environment & Forests

MoH&FW- Ministry of Health & Family Welfare

PMSSY- Pradhan Mantri Swasthya Suraksha Yojana

PPE- Personal Protective Equipment

PRO- Producer Responsibility Organization

SE- Superintending Engineer

SPCB- State Pollution Control Board

STP- Sewage Treatment Plant

WHO- World Health Organization

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Dr. Biraj Chandra Paul
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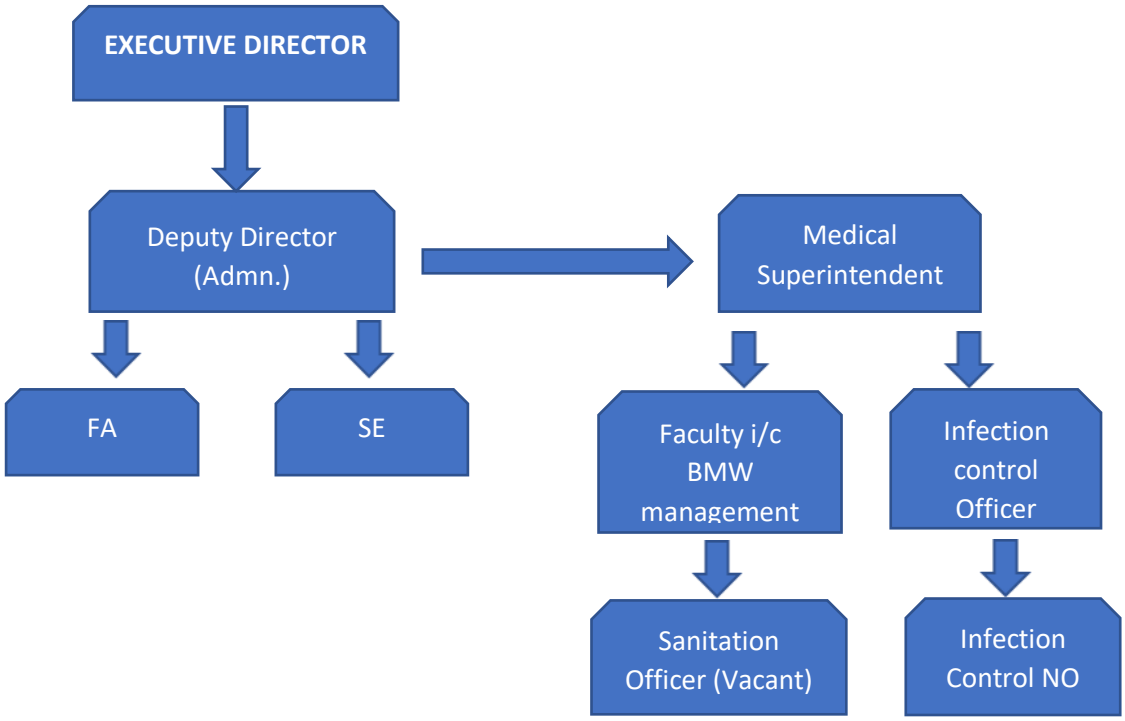
I. INTRODUCTION:

That AIIMS Guwahati has been established under PMSSY in May 2017 with the aim of correcting regional imbalances in quality tertiary level healthcare services with 750 sanctioned bed strength including 30 AYUSH beds. The Honourable Prime Minister of India Shri Narendra Modi on April 14th 2023 has inaugurated, AIIMS, Guwahati and dedicated it to the nation. The hospital is having intake of 100 MBBS students and 60 nursing students in each session at present.

AIIMS GUWAHATI ORGANOGRAM: BIOMEDICAL WASTE (BMW) MANAGEMENT PERSPECTIVE



II. BIO-MEDICAL WASTE MANAGEMENT

Bio-medical Waste (Management & Handling) Rules, 1998 were notified by the Ministry of Environment & Forests (MoEF) under the Environment (Protection) Act, 1986. In exercise of the powers conferred by Section 6, 8 and 25 of the Environment (Protection) Act, 1986 (29 of 1986), and in supersession of the Bio-Medical Waste (Management and Handling) Rules, 1998 and further amendments made thereof, the Central Government vide G.S.R. 343(E) dated 28th March, 2016 published the Bio-medical Waste Management Rules, 2016. These rules apply to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio-medical waste in any form including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, animal houses, pathological laboratories, blood banks, AYUSH hospitals, clinical establishments, research or educational institutions, health camps, medical or surgical camps, vaccination camps, blood donation camps, first aid rooms of schools, forensic laboratories and research labs.

On March 28, 2018, the Government of India published the Biomedical Waste Management (amendment) Rules, 2018 to amend Biomedical Waste Management Rules, 2016 followed by Biomedical Waste Management (amendment) Rules, 2019 and Biomedical Waste Management (second amendment) Rules, 2019 in the year 2019.

The prescribed authority for enforcement of the provisions of these rules in respect of all the health care facilities located in any State/Union Territory is the respective State Pollution Control Board (SPCB)/ Pollution Control Committee (PCC) and in case of health care establishments of the Armed Forces under the Ministry of Defence shall be the Director General, Armed Forces Medical Services (DGAFMS). These rules stipulate duties of the Occupier or Operator of a Common Bio-medical Waste Treatment Facility as well as the identified authorities. According to these rules, every occupier or operator handling bio-

medical waste, irrespective of the quantity is required to obtain authorisation from the respective prescribed authority i.e., State Pollution Control Board and Pollution Control Committee, as the case may be. These rules consist of four schedules and five forms.

"Bio-medical waste" means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps.

"Bio-Medical Waste Treatment and Disposal Facility" means any facility wherein treatment, disposal of bio-medical waste or processes incidental to such treatment and disposal is carried out, and includes common bio-medical waste treatment facilities

The health care facilities, while generating the waste are responsible for segregation, collection, in-house transportation, pre-treatment of waste and storage of waste, before such waste is collected by Common Bio-medical Waste Treatment Facility (CBWTF) Operator. Thus, for proper management of the waste in the healthcare facilities the technical requirements of waste handling are needed to be understood and practiced by each category of the staff in accordance with the BMWM Rules, 2016 and its amendments.

III. CLASSIFICATION OF HEALTHCARE WASTE

GENERAL CLASSIFICATION OF HEALTH CARE WASTE

All the waste generated from the health care facility can be classified as:

1. **Bio Medical Waste:**

   The quantity of such waste is around 10% to 15% of total waste generated from the Health Care Facility.

2. **General Waste:**

   General waste consists of all the waste other than bio-medical waste and which has not been in contact with any hazardous or infectious, chemical or biological secretions and does not include any waste sharps. This waste consists of mainly:

   (i) News paper, paper and card boxes (dry waste)

   (ii) Plastic water bottles (dry waste)

   (iii) Aluminium cans of soft drinks (dry waste)

   (iv) Packaging materials (dry waste)

   (v) Food Containers after emptying residual food (dry waste)

   (vi) Organic / Bio-degradable waste - mostly food waste (wet waste)

   (vii) Construction and Demolition wastes.

   The quantity of such waste is around 85 % to 90% of total waste generated from the facility. Such waste is required to be handled as per Solid Waste Management Rules, 2016 and C&D Waste Management Rules, 2016 as applicable.

3. **Other Wastes:**

   Other wastes consist of used electronic wastes, used batteries, and radio-active wastes which are not covered under biomedical wastes but have to be disposed of from time to time as and when such wastes are generated as per the provisions laid down under E-Waste

(Management) Rules, 2016, Batteries (Management & Handling) Rules, 2001 and amendments made thereof, and Rules/guidelines under Atomic Energy Act, 1962 respectively

CATEGORIES OF BIOMEDICAL WASTE

Bio Medical Waste Management Rules, 2016 categorises the bio-medical waste generated from the health care facility into four categories based on the segregation pathway and colour code. Various types of bio medical waste are further assigned to each one of the categories, as detailed below:

1. Yellow Category
2. Red Category
3. White Category
4. Blue Category

These categories are further divided as per the type of waste under each category as follows in table 1 below.

Table 1: Categories of Biomedical Waste	
CATEGORY	**TYPE OF WASTE**
YELLOW	**Human Anatomical Waste** Human tissues, organs, body parts and fetus below the viability period (as per the Medical Termination of Pregnancy Act 1971, amended from time to time).
	Animal Anatomical Waste Experimental animal carcasses, body parts, organs, tissues, including the waste generated from animals used in experiments or testing in veterinary hospitals or colleges or animal houses.
	Soiled Waste Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs and bags containing residual or discarded blood and blood components.
	Discarded or Expired Medicine Pharmaceutical waste like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc.
	Chemical Waste Chemicals used in production of biological and used or discarded disinfectants
	Chemical Liquid Waste Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, Silver X - ray film developing liquid, discarded Formalin, infected secretions, aspirated body fluids, liquid from laboratories an d floor washings, cleaning, house - keeping and disinfecting activities etc
	Discarded linen, mattresses, beddings contaminated with blood or body fluid, routine mask & gown.
	Microbiology, Biotechnology and other clinical laboratory waste (Pre-treated) Microbiology, Biotechnology and other clinical laboratory waste: Blood bags, Laboratory cultures, stocks or specimens of microorganisms, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.
RED	Wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes without needles, fixed needle syringes with their needles cut, vacutainers and gloves
WHITE	Waste Sharps including metals Needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades, or any other contaminated sharp object that may cause puncture and cuts. This includes both used, discarded and contaminated metal sharps
BLUE	Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes. Metallic body implants

IV. STEPS OF BIO-MEDICAL WASTE MANAGEMENT:

Step 1: Waste Segregation in colour coded and barcode labelled bags/ containers at source of generation

Step 2: Pre-treat Laboratory and Highly infectious waste

Step 3: Collection and Storage of segregated waste in colour coded bags/ containers/ bins

Step 4: Intra-mural transportation from generation site to central storage area

Step 5: Storage

Step 6: Treatment

Step 7: Disposal

First five steps (Segregation, Pre-treatment, Collection, Intramural Transportation and Storage) are the exclusive responsibility of Health Care Facility. While Treatment and Disposal is primarily responsibility of CBWTF operator except for lab and highly infectious waste, which is required to be pre-treated by the HCF. Following are the responsibility of HCF for management and handling of bio-medical waste:

1. Biomedical Waste should be segregated at the point of generation by the person who is generating the waste in designated colour coded bin/ container
2. Biomedical Waste & General Waste shall not be mixed. Storage time of waste should be as less as possible so that waste storage, transportation and disposal is done within 48 hours.
3. Chlorinated plastic bags for collection of biomedical waste should not be used by the HCF.
4. No secondary handling or pilferage of waste shall be done at healthcare facility. If CBWTF facility is available at a distance of 75 km from the HCF, bio-medical waste should be treated and disposed only through such CBWTF operator.
5. Only Laboratory and Highly infectious waste shall be pre-treated onsite before sending for final treatment or disposal through a CBWTF Operator.

6. To provide bar-code labels on all colour coded bags or containers containing segregated bio-medical waste before such waste goes for final disposal through a CBWTF.

BIO MEDICAL WASTE SEGREGATION

Bio- medical waste generated at the institute is required to be segregated at the point of generation as per the colour coding stipulated under Schedule-I of BMWM Rules, 2016 and its amendment thereafter. Following activities to be followed to ensure proper waste segregation:

1. Waste must be segregated at the **point of generation** of source and not in later stages. As defined earlier too, **"Point of Generation"** means the location where wastes initially generate, accumulate and is under the control of doctor / nursing staff etc. who is providing treatment to the patient and in the process generating bio-medical waste.
2. Posters / placards for bio-medical waste segregation should be provided in all the wards as well as in waste storage area.
3. Adequate number of colour coded bins / containers and bags should be available at the point of generation of bio-medical waste.
4. Colour coded plastic bags should be in line with the Plastic Waste Management Rules, 2016.
5. Provide Personnel Protective Equipment to the bio-medical waste handling staff

Colour Coding and Type of Container/ Bags to be used for Waste Segregation & Collection

As per Schedule I of the Bio Medical Waste Management Rules, 2016 and its amendment in 2018 & 2019, following colour coding and type of container/bags is needed to be used by the HCFs for segregation and collection of generated Bio Medical Waste from the facility.

Table 2: Storage of Biomedical Waste

S. No.	Category	Type of waste	Colour & Type of Container
1.	Yellow Category	- Human Anatomical Waste - Animal Anatomical Waste - Soiled Waste - Discarded or Expired Medicine - Microbiology, Biotechnology and other clinical laboratory waste - Chemical Waste (yellow-e) - Chemical Liquid Waste	Yellow coloured non-chlorinated Plastic Bags and containers  Note: (i) Chemical waste (yellow-e) comprising of un-used, residual or date expired liquid chemicals including spent hypo of X-Ray, should be stored in yellow container
2.	Red Category	Contaminated Waste (Recyclable)	Red Coloured Non-Chlorinated Plastic Bags (having thickness equal to more than 50 μ) and Containers 
3.	White Category	Waste Sharps including metals	White Coloured translucent, puncture proof, leak proof, Temper Proof containers 
4.	Blue Category	- Glassware - Metallic Body Implants	Puncture proof, leak proof boxes or containers with blue coloured marking 

BIO MEDICAL WASTE COLLECTION

Time of Collection

1. Bio-medical waste should be collected on daily basis from each ward of the hospital at a fixed interval of time. There can be multiple collections from wards during the day.
2. The institute should ensure collection, transportation, treatment and disposal of bio-medical waste as per BMWM Rules, 2016 and its amendments, and the institute should also ensure disposal of human anatomical waste, animal anatomical waste, soiled waste and biotechnology waste within 48 hours.
3. Collection times should be fixed and appropriate to the quantity of waste produced in each area of the health-care facility.
4. General waste should not be collected at the same time or in the same trolley in which bio-medical waste is collected.
5. Collection should be daily for most wastes, with collection timed to match the pattern of waste generation during the day. For example, in an IPD ward where the morning routine begins with the changing of dressings, infectious waste could be collected mid-morning to prevent soiled bandages remaining in the area for longer than necessary.
6. General waste collection, must be done immediately after the visiting hours of the institute, as visitors coming to facility generate a lot of general waste and in order to avoid accumulation of such general waste in the institute. The collection timings must enable the institute to minimize or nullify the use of interim storage of waste in the departments.
7. Bio-medical waste collected by the staff, should be provided with PPEs.

Packaging

1. Bio-medical waste bags and sharps containers should be filled to no more than three quarters full. Once this level is reached, they should be sealed ready for collection.
2. Plastic bags should never be stapled but may be tied or sealed with a plastic tag or tie.

3. Replacement bags or containers should be available at each waste-collection location so that full ones can immediately be replaced.
4. Colour coded waste bags and containers should be printed with the bio-hazard symbol, labelled with details such as date, type of waste, waste quantity, senders name and receiver's details as well as bar coded label to allow them to be tracked till final disposal.
5. Ensure that Bar coded stickers are pasted on each bag as per the guidelines of CPCB

Interim Storage

1. Interim storage of bio medical waste is discouraged in the wards / different departments of HCF.
2. If waste is needed to be stored on interim basis in the departments it must be stored in the dirty utility/sections.
3. No waste should be stored in patient care area and procedures areas such as Operation Theatre. All infectious waste should be immediately removed from such areas.
4. In absence of dirty utilities/ sections such BMW must be stored in designated place away from patient and visitor traffic or low traffic area.

IN HOUSE TRANSPORTATION OF BIO MEDICAL WASTE

Transportation Trolleys

In house transportation of Bio Medical Waste from site of waste generation/ interim storage to central waste collection centre, within the premises of the hospital must be done in closed trolleys / containers preferably fitted with wheels for easy manoeuvrability. Such trolleys or carts are designated for the purpose of Bio Medical Waste Collection only. Patient trolleys must not be used for BMW transportation. Size of such waste transport trolleys should be as per the volume of waste generated from the institute.

Route of intramural transportation of bio-medical waste

Bio-Medical Waste Generated from different wards or laboratories in the institute must be transported in the covered trolleys/carts through a route which has low traffic flow of patients and visitors.

Route of transportation preferably be planned in such a way that:

1. Transportation does not occur through high-risk areas
2. Supplies and waste are transported through separate routes.
3. Waste is not transported through areas having high traffic of patients and visitors
4. Central Waste collection area can be easy accessed through this route
5. Safe transportation of waste is undertaken to avoid spillage and scattering of waste

CENTRAL WASTE COLLECTION ROOM FOR BIO-MEDICAL WASTE

The institute is having designated central waste collection room situated within its premises for storage of bio-medical waste, till the waste is picked and transported for treatment and disposal at CBWTF. The room is under the responsibility of a designated person and under lock & key. The following points may be considered for construction of central waste collection room:

1. The location of central waste collection is away from the public/ visitor's access.
2. The space allocation for this room is as per the quantity of waste generated from the hospital.
3. The space is sufficient so as to store at least two days generation of waste.
4. Central waste collection room is RCC building and is under lock and key under the responsibility of designated person.

5. The entrance of this centre is accessible through a concrete ramp for easy transportation of waste collection trolleys.
6. Flooring is concrete with tiles and with slope so as to ease the cleaning of the area.
7. Exhaust fans should be provided in the waste collection room for ventilation.
8. It is to be ensured by the health care facility that such central storage room is safety inspected for potential fire hazard and based on such inspection preventive measure has to be taken by the health care facility like installation of fire extinguisher, smoke detector etc.
9. There is provision of water supply adjacent to central waste storage area for cleaning and washing of this station and the containers. The drainage from the storage and washing area are routed to the Effluent Treatment Plant.
10. Sign boards indicating relevant details such as contact person and the telephone number has been provided.
11. The entrance of this station has been labelled with "Entry for Authorized Personal Only" and Logo of Bio Medical Waste Hazard.
12. It is to be ensured that no general waste is stored in the central waste collection area.

Other Considerations for Central Waste Collection Area

1. To ensure there is no pilferage of recyclables, it is to be ensured that central storage area is under lock & key, guarded by a designated person.
2. The institute needs to maintain the record of waste generated and handed over to the authorized recyclers.
3. To ensure protection from the animals, it is to be ensured by the institute that there is no stray animal in the health care facility premises and institute has installed cattle traps at the entrance of the health care facility.
4. To ensure protection against the pests it is to be ensured by the institute that it has engagement of the pest control agency for taking the pest control measures in the central storage area on regular basis.

RECORD KEEPING

1. The institute need to maintain the records w.r.to category wise bio-medical waste generation and its treatment disposal (through CBWTF) on daily basis.

2. Category wise quantity of waste generated from the facility must be recorded in Bio Medical Waste Register/logbook being maintained at central waste collection area under the supervision of one designated person.

3. A weighing machine as per the specifications given in CPCB guidelines for bar code system has been kept in central waste collection centre of the institute for weighing the quantity of Bio Medical Waste.

4. Records on Annual Report on bio-medical waste management submitted to SPCB

5. Records w.r.t. Accident Report submitted to SPCB including "NILL" report.

6. Records shall be maintained on training on BMW Management including both Induction and in service training records.

7. Maintain records for Annual Health check-up of all the employees.

8. Maintain record on Immunisation of all the employees.

9. Records shall be maintained w.r.t. minutes of meeting of Bio Medical Waste Management committee

10. Records shall be maintained indicating details of accident occurred including preventive and corrective actions taken by the institute in relation to such accidents.

11. Records for the operation of the biomedical treatment equipment installed, if any for the treatment of biomedical waste. Please refer Annexure IX for format of logbook/records maintained for autoclave for pre-treatment of yellow (h)

12. Records of testing of Effluent generated from health care facility

13. Record of recyclable waste (plastic/glass) handed over to the authorized recycler in kg/annum.

The records related to the handling of BMW by healthcare facilities needs to be retained for a period of five years.

UPDATING OF INFORMATION IN WEBSITE

AIIMS, Guwahati, as prescribed under BMWM Rules, 2016 and its amendment has developed a separate page/web link in its website for displaying the information pertaining to their hospital. The following information are uploaded and updated time to time:

1. Contact Address and details of the institute:
2. No. of beds:
3. Details of:

   a) Authorisation under BMWM Rules, 2016 and its amendment:

   b) Consent under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981:
4. Quantity of bio-medical waste generation (in kg/day):
5. Mode of disposal of bio-medical waste (through CBWTF):
6. Name and address of the CBWTF through which waste is disposed of:
7. Monthly records of bio-medical waste generation (category wise):
8. No. of trainings conducted on Bio-medical Waste Management in the current year:
9. Status of immunization of Health Care Workers involved in handling of BMW:

V. SEGREGATION, TREATMENT AND DISPOSAL OF BMW

TREATMENT OPTION FOR BIO-MEDICAL WASTE

As per BMWM Rules, 2016 and its amendment the treatment and disposal of BMW generated from the institute must be carried out in accordance with Schedule I, and in compliance with the standards provided in Schedule II of BMWM Rules, 2016 and its amendment thereafter.

It is also emphasized in the rules that no healthcare facility shall establish on-site treatment and disposal facility for BMW, if a service of CBWTF is available within 75 kilometres of travelling distance of the facility.

Since AIIMS, Guwahati is within reach of 75 kilometres of CBWTF hence it is disposing of the BMW through such CBWTF only and are not allowed to establish its own treatment and disposal facility.

Yellow Category

Type of Waste:

Yellow (a): Human Anatomical Waste

Segregation:

Human tissues, organs, body parts and fetus below the viability period. This includes, placenta and extracted tooth.

Type of bag and container:

Collect the waste in yellow coloured non chlorinated plastic bag and store in yellow coloured container.

Treatment and Disposal: For this the institute is having linkage with CBWTF. No treatment of waste is required to be carried out at the health care facility except pre-treatment (sterilization) of Yellow (h) category waste by autoclaving as per methods prescribed in WHO Blue book 2014. Yellow category waste along with pre-treated waste should be stored in central storage point and must be handed over to CBWTF.

It is mandatory that dead fetus waste should be handed over to CBWTF in yellow bag with a copy of the Guidelines for Management of Healthcare Waste as per Biomedical Waste Management Rules, 2016 and its amendment & Medical Termination of Pregnancy (MTP) certificate from the Obstetrician.

Type of Waste:

Yellow (b): Animal Anatomical Waste

Segregation:

This waste includes experimental animal carcasses, body parts, organs, tissues, including the waste generated from animals used in experiments or testing in veterinary hospitals or colleges or animal houses.

Type of bag and container:

Collect the waste in yellow coloured non chlorinated plastic bag and store in yellow coloured container.

Treatment and Disposal:

No treatment of waste is required to be carried out at hospital except pre-treatment (sterilization) of Yellow (h) category waste (if applicable) by autoclaving as per methods prescribed in WHO Blue book 2014. Yellow category waste along with pre-treated waste should be stored in central storage point and must be handed over to CBWTF.

Type of Waste:

Yellow (c) - Soiled Waste

Segregation: Items contaminated with blood/body fluids like dressings, plaster casts, cotton swabs and bags containing residual or discarded blood and blood components. This includes used infectious material such as caps, shoe-cover, blotting paper/gauze, wooden swab stick, paraffin blocks, indicators tapes and disposable (single use non-linen based) masks and gowns.

Type of bag and container: Collect the waste in yellow coloured non chlorinated plastic bag and store in yellow coloured container

Treatment and Disposal:

No treatment of waste is required to be carried out at the health care facility. Waste must be handed over to CBWTF

Type of Waste:

Yellow (d) - Expired and Discarded Medicine

Segregation: Pharmaceutical waste like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc. This includes cytotoxic drugs dispensed in dextrose / saline bottles and disposables used in delivery of cytotoxic drugs.

Type of bag and container: Collect all the expired and discarded medicines except for cytotoxic drugs waste in a separate yellow coloured non chlorinated plastic bag (different form being used for human anatomical waste) and store in yellow coloured container. All the cytotoxic drugs including all items contaminated with cytotoxic drugs along with glass or plastic ampoules, vials etc. must be collected in separate yellow coloured non chlorinated plastic bag labelled as cytotoxic hazard.

Treatment and Disposal:

No treatment of waste is required to be carried out at the health care facility. As per BMW Rules, 2016 all the expired and discarded medicines including cytotoxic drugs expired cytotoxic drugs are either returned back to the manufacturer or are handed over to the CBWTF to be disposed of through incineration at temperature > 1200 ^{o}C.

Type of Waste:

Yellow (e) - Chemical Waste

Segregation: This waste comprises of chemicals used in production of biological, discarded containers of chemicals and disinfectants etc. This includes solid or liquid residual chemicals used in the institute.

Type of bag and container: Collect solid chemical waste in yellow-coloured containers or non-chlorinated yellow plastic bag. Collect un-used, residual or date expired liquid chemicals in yellow container.

Treatment and Disposal:

No treatment is required to be carried out at the facility. The chemical waste (liquid or solid chemicals) should be collected into different yellow coloured plastic containers, whereas empty chemical containers with residual chemicals should be collected in yellow bags and handover to CBWTF operator for final disposal by incineration. It is required to specify the name of chemical on the yellow containers so that it would help CBWTF operator to decide whether to incinerate or transfer to Hazardous Waste TSDF for final disposal.

Type of Waste:

Yellow (f) - Chemical Waste

Segregation: Liquid waste generated due to use of chemicals in production of biological and used or discarded disinfectants, silver X- ray film developing liquid, discarded formalin, infected secretions, aspirated body fluids, liquid from laboratories and floor washings, cleaning, house-keeping and disinfecting activities, etc. Leftover, unused, residual or date expired liquid chemicals shall not be discharged as chemical liquid waste.

Type of bag and container: Not applicable since this liquid waste containing waste chemicals is collected and pre-treated prior to disposal through Effluent Treatment Plant. However, recyclable liquid chemicals such as spent X-ray hypo should be collected in yellow containers and sold or given to only authorised recyclers for resource recovery.

Treatment and Disposal: As per the BMWM Rules 2016, the chemical liquid waste of the hospital must be collected through a separate collection system for pre-treatment. Hospitals with large standalone labs shall install separate drainage system leading to pre-treatment unit prior to mixing the same with rest of the wastewater from hospital for further treatment.

Type of Waste:

Yellow (g) - Discarded Linen, Mattresses, beddings contaminated with Blood, body fluids, routine mask and gown.

Segregation This includes discarded linen from bedsheets, beddings, re-usable routine masks and gowns.

Type of bag and container

Collect the waste in yellow coloured non-chlorinated plastic bag and store in yellow coloured container.

Treatment and Disposal:

Disinfect the waste linen with non-chlorinated chemical disinfection and hand over to the CBWTF operator for final disposal by incineration. The waste mattresses should be cut into pieces and disinfected and can be sent to the CBWTF operator for final disposal by incineration. Alternatively, waste mattresses can be cut into pieces and disinfected with non-chlorinated chemicals for disposal as general waste (dry-waste) for energy recovery in cities having waste to energy plants or RDF (Refuse Derived Fuel) plants. The waste mattresses shall not be sold or auctioned. Used bed sheets that are not soiled and re-usable can be sold or auctioned only after washing and disinfection. Disposable (single use non-linen based) masks and gowns, after use shall be treated as yellow-c (soiled waste).

Type of Waste:

Yellow (h) Microbiology, Biotechnology and Other Clinical Laboratory Waste:

Segregation: Microbiology, Biotechnology and other clinical laboratory waste, waste blood bags (containing date expired or contaminated blood), Laboratory cultures, stocks or specimen of micro- organisms, live or attenuated vaccines, human cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures. This includes plastic culture plates and other highly infectious wastes.

Type of bag and container: Collect the waste in yellow coloured non chlorinated plastic bag and store in yellow coloured container

Treatment and Disposal:

Pre-treatment by disinfection before handing over the waste to CBWTF operator. Pre-treatment can be done by autoclave.

Pre-treatment can also be done by using non-chlorinated chemical disinfectants like aldehydes, lime-based powders or solutions, ozone gas, ammonium salts and phenolic compounds. The pre-treated waste bags should be handed over to CBWTF operator on daily basis.

Red Category

Segregation: Red category waste is contaminated recyclable waste containing primarily plastics generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and fixed needle syringes with their needles

cut), vacutainers and gloves. This includes waste pipette tips, plastic pipette, Eppendorf, rubber teats, drains, oxygen mask, thick plastic splash proof gowns, rubber apron, ICT test cards, ELISA plate and vials not containing blood samples.

Type of bag and container: Collect the waste in red coloured non chlorinated plastic bag and store in red coloured container.

Treatment and Disposal:

Contaminated recyclable waste containing mainly plastics and rubber shall be put in red coloured non chlorinated plastic bags and containers. Syringes after removing/cutting the needles should also be put in this category. Vacutainers/vials with blood samples should be pre-treated and disposed as yellow-h category waste. No onsite treatment of Red category waste is required. All such waste is needed to be sent to CBWTF for final treatment and disposal.

White Category

Segregation: This waste comprises of needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades, or any other contaminated sharp object that may cause puncture and cuts. This includes waste sharps such as lumbar puncture needle, trocar cannula, IABP cannula, arthroscopy blade, insulin pen needle, lancet needle, removac needle, eye needle, Cardioplegia needle and surgical stab knife

Type of bag and container: Collect the waste in white translucent, puncture proof, leak-proof, tamper-proof container.

Treatment and Disposal: For HCF having linkage with CBWTF

After collection in puncture proof, leak-proof, tamper-proof container, handover the waste to CBWTF without any alteration or onsite treatment.

Blue Category

Type of Waste: Blue (a) Glassware Segregation: Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes. This includes glass slides and glass pipettes

Type of bag and container: Puncture proof, leak proof boxes or containers with blue coloured marking

Treatment and Disposal:

Dispose of the empty glass bottles by handing over to CBWTF without any onsite treatment. The residual chemicals in glass bottle should be collected as chemical waste in yellow coloured container / bags and over to CBWTF as yellow(e) waste.

Type of Waste: Blue (b) Metallic Body Implants

Segregation Implants used for orthopaedic surgeries. This includes metal sternal wire, Gigli saw wire and Orthopaedic Splint.

Type of bag and container: Puncture proof, leak proof boxes or containers with blue coloured marking.

Treatment and Disposal: Dispose of the waste by handing over to CBWTF.

VI. BMW MANAGEMENT AT OUTREACH ACTIVITIES

While performing some outreach activities by providing services to the population outside the premises of HCF. Some of such activities like immunization programmes and home delivery services generate bio medical waste and are needed to be handled in order to avoid any harm to environment and human health. This section provides the details of the activities needed to be carried out by the health care workers during such activities so as to ensure that handling of the BMW generated from these activities are done as per the BMW Rules, 2016 and its amendments. This section details about the responsibility for management of BMW during such activities, steps of BMW management for outreach activities and collection, treatment and disposal methods of BMW generated during such outreach activities.

RESPONSIBILITY

The department of the institute organising the outreach activities is totally responsible for ensuring that waste generated during such activity is properly segregated, collected, treated and disposed of as per BMWM Rules, 2016 and its amendment.

OUT REACH ACTIVITIES

The institute may provide any of the outreach services given below;

- Blood donation camps/Health camps;
- Antenatal Care;
- Point of care diagnosis;
- Immunization;
- Family Planning activities;
- Other similar activity

During the above activities, the bio medical waste generated is required to be segregated, collected at the site of generation itself and has to be transported back to institute for treatment and disposal. Alternatively, arrangement can be made with CBWTF operator to pick-up the segregated waste directly from camp-site after completion of activity. Anatomical waste and

soiled waste need to be treated and disposed within 48 hours once generated during the above activities.

STEPS FOR BIO MEDICAL WASTE MANAGEMENT FOR OUT REACH ACTIVITIES

1. Segregate biomedical waste at the point of generation i.e. during the outreach activity

2. Collection and packaging of waste in colour coded and bar code labelled bags/containers

3. Transportation of waste from outreach activity site to HCF or make arrangement with nearby CBWTF to collect the waste directly after completion of outreach activity.

VII. MANAGEMENT OF GENERAL WASTE

As per Bio Medical Waste Management Rules 2016 and its amendments, the general waste generated from the healthcare facility must be disposed of in accordance with the provisions of Solid Waste Management Rules, 2016.

General Requirements for Institute:

Health care facilities must ensure that the general solid waste generated from the facility is segregated and collected in a separate bins filled in with non-chlorinated bags and shall not be mixed up with the BMW generated in the facility.

Requirements of HCFs in management of solid waste are given below:

- Collect segregate waste in two separate streams namely bio-degradable waste and dry-waste. Green bins shall be provided for bio-degradable wastes and blue bin for dry wastes. Colour coded bins may be either painted or labelled with particular colour.

- Plastic sheets provided inside the bins shall be of minimum 50 micron thick as required under plastic waste management Rules, 2016. In case of bio-degradable waste collection bins, it is recommended to use compostable plastic bags of any thickness.

- Waste collected in bins shall be handed over to authorised waste pickers or waste collectors as per the direction or notification by the local authorities from time to time;

- AIIMS, Guwahati has set-up on-site compost plants for bio-degradable waste.

- Used sanitary waste like diapers, sanitary pads etc. generated from hospitals should preferably be wrapped in the pouches provided by the manufacturers or brand owners of these

products or in a suitable wrapping material and disposed along with soiled waste (yellow c) category waste for incineration.

- To store horticulture waste and garden waste generated from his premises separately in their own premises and dispose of as per the directions of the local body (local authorities) from time to time.

- General waste shall not be thrown or burnt on streets, open public spaces outside the premises or in the drain or water bodies.

- HCFs shall pay user fee for solid waste management, as may be specified in the byelaws of the local body.

- HCFs shall handover segregated waste to authorized waste collector or agency as specified by the local body.

- General waste should not be stored in central waste storage area meant for Bio Medical Waste generated for the facility, but is stored separately, till it is handed over to authorised waste picker of local bodies/ municipality.

- Any BMW generated should not be mixed with the general waste.

To ensure the same, health care facilities have to train all the staff of institute to segregate general wastes and they shall also caution or advise the visitors in HCFs to follow the same.

VIII. MANAGEMENT OF OTHER WASTES

MANAGEMENT OF USED BATTERIES

As per the provisions under Batteries (Management & Handling) Rules, 2001 (as amended thereof), used lead acid batteries generated from health care facilities (HCFs) should be sold/auctioned/sent only to the authorised dealers, designated collection centres or authorised recyclers or any authorised agency. In no case the used batteries be handed over to an unauthorised person. Hospital having purchased more than 100 batteries should maintain records of number of batteries purchased, and number of used batteries sent to registered recyclers/authorised dealers/designated collection centres/any other agency as per Form VIII of Batteries Rules, 2001/ any latest amendment thereof and the returns shall be filed half yearly i.e. by 30th June and 31st December of every year to the concerned State Pollution Control board.

MANAGEMENT OF RADIOACTIVE WASTES

The Atomic Energy Regulatory Board (AERB) has been mandated by the Central Government, as the Competent Authority as per Atomic Energy (safe Disposal of Radioactive Wastes) Rules, 1987 notified under the Atomic Energy Act 1962. It exercises regulatory control over nuclear installations and the use of radioactive substances and radiation generating plants outside such installations. AERB also empowered to perform the functions as stipulated under sections 10(1) (powers of entry) and 11(1) (powers to take samples) of

Environmental (Protection) Act, 1986 and Rule 12 (agency to which information on excess discharge of pollutants to be given) of the Environmental (Protection) Amendment Rules, 1987 with respect to radioactive substances.

As per provisions of Atomic Energy (safe Disposal of Radioactive Wastes) Rules, 1987, no person shall dispose of radioactive waste

(a) unless he has obtained an authorization from the competent authority under these rules;

(b) in any manner other than in accordance with the terms and conditions specified in the authorization issued under these rules;

(c) in any location different from those specified in the authorization; and

(d) in quantities exceeding those specified in the authorization.

Health Care Facilities generating radionuclides waste from treatment of Cancer patients and end-of-life equipment containing radio radionuclides shall obtain authorization from AERB for its disposal.

As per the policy of AERB, radionuclides wastes are required to be re-exported back to the manufacturer. It was recommended that such generators shall ensure arrangement with manufacturer at the time of purchase of such equipment. Waste disposal facilities of AERB are regulated by Waste Disposal Agency (Division) of AERB.

MANAGEMENT OF E-WASTES

As per provisions under E-Waste (Management) Rules, 2016, as amended every generator of end of life electrical and electronic equipment (EEE) listed under Schedule I are required to ensure that such E-Waste is sent to an authorized E-Waste dismantling or recycling facility or an authorised collection centre of the Producer of EEE or through designated take back service providers of Producers or registered Producer Responsibility Organization (PRO) of a Producer.

E-waste can be auctioned only to authorised E-Waste Recyclers/ Dismantlers/ PRO of a Producer. Records of E-Waste transfer/sale should be maintained records in Form -2 for verification of the SPCBs and Annual returns as per Form-3 of E-Waste (Management) Rules, 2016, as amended should be submitted to SPCBs by June 30th of every year.

E-Waste generated from hospital equipment not listed in Schedule-I should also be sold/ transferred to only the authorized E-Waste Recyclers/Dismantler

Labelling of the Containers

Label for cytotoxic waste:

CYTOTOXIC HAZARDSYMBOL

HANDLE WITH CARE

Label for Biomedical waste containers or bags

HANDLE WITH CARE

IX. MANAGEMENT REQUIREMENTS:

Roles & Responsibility of Healthcare Facility

As per the provisions under BMW Management Rules, 2016 and its amendment thereof, the following responsibilities have been bestowed upon healthcare facilities;

- To ensure that all the legal requirements related to the Bio Medical Waste Management are complied with and are regularly updated.
- To ensure that annual reports and accidents reports are submitted to SPCB in a timely manner.
- To ensure that biomedical waste is handled without any adverse effect to human health and the environment.
- To have a provision within the premises for a safe, ventilated and secured location for storage of segregated biomedical waste at central storage area.
- To ensure that there shall be no secondary handling, pilferage of recyclables or inadvertent scattering or spillage by animals.
- To ensure that bio-medical waste from central storage area or the premises shall be directly transported to the common bio-medical waste treatment facility for the appropriate treatment and disposal
- To ensure pre-treatment of yellow-h waste comprising of microbiology, biotechnology and other clinical laboratory waste, waste blood bags (containing date expired or contaminated blood), Laboratory cultures, stocks or specimen of micro- organisms, live or attenuated vaccines, human cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures and other highly infectious wastes before handling to over to CBWTF for final disposal.
- To pre-treat vacutainers/vials containing blood samples and handover to CBWTF as Red category waste.

- To phase out use of chlorinated plastic bags (excluding blood bags) and gloves by 27 March, 2019.
- To ensure that the solid waste other than BMW is disposed of as per Solid Waste Management Rules, 2016.
- To establish a bar-code system for bags or containers containing bio-medical waste destined for disposal at CBWTF before 27th March, 2019.
- To ensure all the staffs of HCFs are provided regular training on BMW handling both at the time of induction and on annual basis as well
- To ensure occupational safety of all the employees through annual health check-ups, immunization and provisions of appropriate and adequate PPEs.
- To ensure that BMW Register is maintained and is updated on day-to-day basis
- Bedded HCFs to ensure uploading annual records of the biomedical waste generated on its website by 15 March, 2020.
- To immediately inform the SPCB in case of any lapse by waste collection agency or CBWTF in collection of waste from the HCF.
- To ensure that all the activities of BMW management are monitored and reviewed.
- To ensure that the committee formed for monitoring and review of BMW management is functioning properly.
- To ensure that all the records related to BMW Management are maintained by HCF. The above listed responsibilities are detailed in these guidelines, laying down steps needed to be undertaken by health care facility to fulfil these responsibilities

AUTHORIZATION

APCB shall grant authorization for HCF in form III and the validity of the authorization will be synchronized with validity of Consents to Operate

Responsibility

"Authorization" means permission granted by the prescribed authority for the generation, collection, reception, storage, transportation, treatment, processing, disposal or any other form of handling of bio-medical waste in accordance with these rules and guidelines issued by the Central Government or Central Pollution Control Board (CPCB) as the case may be; As per BMWM Rules, 2016, every hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank, health care facility and clinical establishment, irrespective of their system of medicine and by whatever name they are called are required to obtain authorization from the prescribed authority i.e. State Pollution Control Board / Pollution Control Committee, as the case may be. Validity of authorization in case of bedded health care facilities will be synchronized with the validity of the consents. Overall responsibility of having valid authorizations and consents under various acts lies with the In-charge of the health care facility.

Authorization under Bio-Medical Waste Management Rules, 2016

Procedure for Authorization and consent:

The applicant can apply online through Online Consent Management & Monitoring System, Ministry of Environment, Forest and Climate Change, Government of India web portal link https://asocmms.nic.in/OCMMS/. For registration, user needs to go with “New Industry Registration” link. Registration page will appear on screen. On this page, user needs to fill up all the details regarding industry and Occupier. If user has ID and password they can login directly. There are two types of logins, 1st is for the board user, “ASPCB login” and the 2nd is “Industrial login”. Industry user need to select “Industrial login” after registration.

Application

Application must be submitted to the respective SPCB for fresh or renewal of authorization in prescribed format as per Form II as prescribed under Bio Medical Waste Management Rules, 2016 and amendment thereof.

Information requirements of Application

- Particulars of Health Care Facility: Name, Address, Contact Details etc.
- Validity of Consents under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981 (in case of bedded HCFs)
- Detail of HCF: Number of beds, Average number of patient treated per month
- Category wise Quantity of Waste Generated or disposed by the health care facility
- Detail of any treatment facility available in the premises of health care facility

Grant of Authorization

Upon verification and ensuring the HCF is having requisite facilities, the authorization is granted by the respective State Pollution Control Board (SPCB) in a prescribed form, with unique number of authorization and date of issue.

Validity of Authorization - The validity of this authorization is synchronized with the validity of:

1) Consent under Air (Prevention and Control of Pollution) Act, 1981:

2) Consent under the Water (Prevention and Control of Pollution) Act, 1974

Agreement with Common Bio Medical Waste Treatment Facility (CBWTF)

Each health care facility which is situated within reach of 75 kilometres of CBWTF needs to have a valid agreement with authorised CBWTF for treatment and disposal of Bio Medical Waste generated from the HCF. HCFs located beyond 75Km may also join the CBWTF if operator is capable and willing to provide the services as required under BMW Rules, 2016. It has to be ensured by the HCF, that the CBWTF operator collects the waste within a specified time, and the untreated biomedical waste especially untreated human anatomical, animal anatomical, soiled waste and biotechnology waste is treated and disposed within a period 48 hours.

Agreement must also specify the responsibilities of CBWTFs and payment conditions including options such as supply of non-chlorinated bags, supply of bar-coded labels, etc.

Reporting to State Pollution Control Board or Pollution Control Committee

Annual Reporting:

As per the Bio Medical Waste Management Rules, 2016, the healthcare facility is required to submit the Annual Report to the SPCB on or before 30th June every year, for the period from January to December of the preceding calendar year

The annual report should be filled in the prescribed format as per the Form IV prescribed under BMW Management Rules, 2016 and its amendment.

The annual report contains details of following:

- Particulars of Occupier/ HCF
- Quantity of waste generated in kg/annum
- Details of storage, treatment, transportation, processing and disposal facility
- Details of training conducted on Bio Medical Waste Management
- Details of accident Occurred
- Details Emission and Effluent testing

Annual Report submitted to the State Pollution Control Board must also be enclosed with following details:

- Training imparted to the Health Care Workers involved in handling of bio-medical waste
- Minutes of Meeting of BMW Management Committee
- Details of Accident Occurred during one year, along with the remedial steps taken
- Records of testing of Emission of DG Sets / boilers
- Records of Effluent generated and its characteristics from health care facility
- Records of pre-treatment of specified waste categories
- Record of recyclable waste handed over to the authorized recycler in kg/annum (where captive treatment facility is allowed by the SPCB
- Records of health status of the Health Care Workers involved in handling of biomedical waste

- Records of immunisation of Health Care Workers involved in handling of bio-medical waste.

The healthcare facility must also ensure that the annual report submitted to the concerned SPCB is also published in its own website

Accident Reporting

Any accident occur during the handling of Bio-Medical Waste in the healthcare facility is having potential to either harm the environment or safety of the human health must be recorded by the HCF. As per the Bio Medical Waste Management Rules, 2016, the accidents are classified into two categories; major and minor.

Major Accidents:

Major accidents include but not limited to following

- Toppling of the truck carrying bio-medical waste
- Accidental release of bio-medical waste in any water bod
- Fire Hazard
- Blasts
- Flooding or erosion of the deep burial pit etc

It is mandatory under BMWM Rules 2016, for healthcare facilities to report each/any major accidents, to the respective State Pollution Control Board/Pollution Control Committee, occurred during the handling of BMW along with the records of remedial actions taken including corrective and preventive actions.

The Accident Report is needed to be forwarded in written to the respective SPCB within 24hrs of accident.

The reporting should be done on the prescribed Form 1 given in BMWM Rules 2016.

Minor Accidents Minor accidents include but not limited to following

- Needle stick injuries,

- Splash exposure or
- Spillage of mercury / chemicals etc.

Such minor accidents need not to be immediately reported to the State Pollution Control Board but is required to be recorded by the health care facility and appropriate remedial actions must be taken by health care facility. Healthcare facility also needs to submit consolidated report on accidents both major and minor, along with the number of persons affected, remedial actions taken and number of fatalities, along with the annual report (for the preceding calendar year) to be submitted to SPCB, on or before 30th June of every year.

Other Reporting Requirements

Besides annual reporting and accident reporting each healthcare facility needs to report to the SPCB in event of following:

- If the waste collection agency or CBWTF does not collect the waste within 48 hours of generation, it is the responsibility of the HCF to immediately inform the respective State Pollution Control Board/Pollution Control Committee about any such lapse.
- It is also mandatory to report to the respective State Pollution Control Board the reason of storing the waste in the facility for a period beyond 48 hours and also the remedial actions taken by the HCFs to ensure that the waste does not adversely affect human health and the environment.

OCCUPATIONAL SAFETY

It is the responsibility of the in charge of the healthcare facility to ensure the occupational safety of the healthcare workers and other staff involved in handling of Bio medical waste in the healthcare facility. As per Bio Medical Waste Management Rules, 2016 occupational safety of the staff has to be ensured in following methods:

- Proving adequate and appropriate Personal Protective Equipment (PPE) to the staff handling Bio Medical Waste. Use of PPE while handling of Bio Medical Waste must be encouraged and must be monitored regularly to ensure occupational safety of staff. PPE should include:
    i. Heavy Duty Gloves (Workman's Gloves)
    ii. Gum Boots or safety shoes for waste collectors
    iii. Face mask
    iv. Head Cap
    v. Splash Proof Gowns or aprons etc.
    vi. Disposal gloves
- Conducting health check-up of all the employees at the time of induction and also at least once in a year.
- Ensuring that all the staff of the health care facility involved in handling of BMW is immunized at least against the Hepatitis B and Tetanus.
- Taking remedial steps in accordance to any accident occurred, leading to any harm to the employee, during the handling of Bio medical waste

Employee Health Check Up

As per Bio Medical Waste Management Rules, 2016, every HCF must ensure that a comprehensive health check-up of each employee and other staff involved in BMW handling is carried out at the time of induction and also as a mandatory procedure to be followed for each year for every employee. Comprehensive Health Check-up includes following but not limited to;

- Present Complaints (If any), with duration

- Vaccination History (especially with respect to Hepatitis B and Tetanus Toxoid)

- Past Medical History

- Past Surgical History

- General Physical Examination

- Dental Examination

- Systemic Examination including Cardiovascular System, Respiratory System, Central Nervous System, Gastrointestinal System, Uro-Genital System, Gynae and Obstet. (in case of females), Musco-skeleton System, EYE and ENT.

- Lab Investigations including: Hb, TLC, DLC, RBS, Blood Urea, S. Creatinine, Urine, Stool etc.

- Radiological Investigations: Chest X ray, USG (If needed), CT or MRI (if needed)

- Inference with Diagnosis

Health Check-up records of all the employees are needed to be maintained in the personal record of each employee for proving compliance

Immunization

All the staff involved in handling of Bio Medical Waste in the health care facility must be immunized against the communicable diseases especially against Hepatitis B and Tetanus. Evaluation of immunization status of the staff must be included in the annual health check-up. Hospital needs to maintain the immunization records of all the staff with dates of immunization and due date of first dose, Second Dose and Booster Dose.

TRAINING OF HEALTHCARE WORKERS

As per Bio Medical Waste Management Rules, 2016 and its amendment thereof, it is mandatory for all the employee of the healthcare facility to be trained on handling of biomedical waste management and handling.

Training Need Analysis

It is mandatory for each health care worker inducted to the HCF to undergo the training on Bio Medical Waste Management at the time of induction. BMW Rules, 2016 also stipulates annual training to the healthcare staff involved in handling of bio medical waste. It is suggested that

the committee/person designated for monitor or review of the activities of BMW management does the training need analysis of the staff based on fowling parameters:

- Theoretical Knowledge
- Demonstration of methods of handling of bio-medical waste
- Practical Implementation

Training Schedule

As per the BMWM Rules, 2016 the minimum requirements for health care facilities is to conduct the training on BMW activities at least annually for all the staff of the facility and also whenever a new staff is inducted into Health Care Facility. It is preferable for each health care facility to create a training calendar for imparting the training on Bio Medical Waste Management Handling and training must be provided as per the formed training plan.

Trainers - Apart from professional trainers, HCFs may also invite the concerned officials of the SPCB and operators of CBWTF to attend in-house training programmes organised by them so as to impart training to staff involved handling of BMW in health care facilities.

- HCFs shall also depute the person designated and other identified staff for attending training programmes as and when conducted by SPCBs

- Nodal Officer for biomedical waste management in HCF may take the responsibility to provide induction training to the newly recruited healthcare staff

- Trained employee of the healthcare worker can also take up the role of trainer.

Training Material

It is a requirement of BMWM Rules, 2016 to have a standard training module for imparting the training in the healthcare facilities. For this purpose, the guidelines can be used as training material for imparting the training or any other relevant material published by approved authorities like SPCB can be used as training material.

Training Records

Health care facilities need to ensure that all the training records pertaining to the Biomedical Waste Management including the induction training records and in service training, for all the staff is needed to be kept for proving compliance. Attendance records of each training needs to maintained and signed by the trainees with name and designation. HCFs need to maintain, compile and provide details of trainings provided for BMW handling to State Pollution Control Board (SPCB). These details have to be submitted along with the annual report to the prescribed authority i.e. SPCB, on or before 30th June of every year.

The training details include:

- Total Number of trainings conducted along with the date of imparting the training
- Total number of participants of each training
- Attendance Record
- Total Number of staff trained on BMW Handling
- Total number of staff trained on BMW handling at the time of Induction
- Total number of staff, not undergone any sought of training on BMW Handling.

Training Effectiveness

Effectiveness of the training can be evaluated by observing the same parameters as listed in training need analysis of the staff or through a test mock/verbal or written, to be conducted after training.

BIOMEDICAL WASTE MANAGEMENT COMMITTEE:

AIIMS Guwahati consists of the following members:

S. No.	Name	Designation & Department	Remarks
1	Prof. (Dr.) Neizekhoto Brian Shunya	Medical Superintendent	Chairperson
2	Dr Bhupen Barman	Professor & Head, Medicine	Member
3			
4	Dr Deepjyoti Kalita	Associate Professor of Microbiology	Member
5	Dr. Muralidhar Reddy Sangam	Additional Professor, Microbiology	Member
6	Dr. Debo Kr. Baruah	Radiation Safety Officer & Addl. Professor, Radiology	Member
7	Dr. Prasad Sudhir Dange	Associate Professor, Pathology	Member
8	Dr. Nilesh Ashok Devraj	Associate Professor, FMT	Member
9	Dr. Mussaraf Hussain	Professor & HOD, Neurology	Member
10	Dr. Kausalya Raghuraman	Assistant Professor, Microbiology	Member
11	Dr. Rajeswarie S	Hospital infection control officer	Member
12	Dr. Kashif Akhtar	Assistant Professor, Orthopedics	Member
13	Dr. Himashree Bhattacharya	Associate Professor, CFM	Member
14	Dr. Abhilash Goel	Assistant Professor, Surgery	Member
15	Mr. Prakash Hazarika	Financial Adviser	Member
16	Mr. Jayanta Kr. Sharma	SE	Member
17	Mr. Sukanta Bhattacharya	EE (Elect.)	Member
18	Dr Biraj Chandra Paul	Asst. Prof., Hosp. Admn.	Member Secretary
19	Ms. Srabana Chandranali Baruah	ICN	Member
20	Mr. Amit	Store Officer	Member
21	Mr. Ajay Kr. Meena	NO I/C Sanitation inspector	Member

The responsibility of this committee are to:

- Improve and streamline the bio medical waste (BMW) management systems for proper implementation of Bio-Medical Waste Management Rules 2016 and its amendment thereof.
- Formulate and ensure implementation of the responsibilities of the various categories of the staff involved in the generation, collection, transportation, treatment and disposal of wastes.
- Monitor biomedical waste handling practices in the organization.

- Ensure periodic training of all categories of staff involved in generating and transporting waste.
- Maintenance of all the records related to BMW handling as per BMWM Rules 2016 and its amendment thereof.
- Ensuring submission of reports to prescribing authority like Accident Reporting & Annual Reporting to SPCB within the stipulated due dates.
- Update and maintain the valid authorization from SPCB
- Have a valid agreement with Common Bio Medical Waste Treatment Facility (CBWTF).
- Take appropriate remedial actions in event of any accident occurrence

Meeting Schedule

It is to be ensured by the HCFs that the committee framed for monitoring of activities of bio medical waste handling in the facility must meet

- At least once in six months and also when needed.
- Committee must meet in event of any accident reported.

Agenda and Meeting Records

It is to be ensured that committee meetings are held in accordance with a predefined agenda for the meeting.

The agenda of meeting, proceedings/ minutes of meeting along with the planned actions with the responsibility delegated for implementation should be recorded and records are to be kept with BMW Committee for proving compliance. All the minutes of meeting of this committee is to be forwarded along with the Annual Report to the prescribing authority i.e. SPCB.

The meeting records for the period from January to December of the preceding year are to be submitted along with Annual Report on or before 30th June of every year.

Liability of Health Care Facility As per the BMWM Rules, 2016, the liability for implementing BMWM Rules, 2016 lies with the occupier or the person having administrative control over the healthcare facility.

He/she shall be liable for any harm that may occur to the environment or people due to improper handling of the BMW generated from the facility. In case of any violation, the occupier shall be liable for action under section 15 of Environment (Protection) Act, 1986. The occupier shall also be liable for complying with the directions if any issued under section 5 of Environment (Protection) Act, 1986 issued by concerned authorities. To avoid any legal implications, the HCF must meet all the responsibilities as listed in these guidelines as well as BMWM Rules, 2016.

Legal Actions that can be taken against HCFs for violation of the provisions or the 'Directions' under Section 5 of 'The Environment (P) Act, 1986' as follows;

- Closure, prohibition or regulation of any operation or process
- Stoppage or regulation of the electricity or water supply
- Closure of the HCFs
- Legal Actions for violation of the provisions under Section 15 of 'The Environment (P) Act, 1986' includes:
- Imprisonment up to five years or fine up to one lakh rupees for each failure or contravention of the Rules or both;
- In case of violation continues, additional fine which may extend to five thousand rupees for every day of violation;
- If the contravention continues beyond a period of one year after the first date of contravention, the offender shall be punishable with imprisonment for term which may extend to seven years (as may be decided by Hon'ble Courts).

X. MONITORING AND REVIEW

Each healthcare facility must ensure that there is a system of monitoring and review of the activities related to the handling of Bio Medical Waste Management.

Bio Medical Waste Management Rules, 2016 and its amendments stipulates that the system to be adopted for monitoring and review of the activities at all the levels of implementation. The monitoring and review is required to be done through following instruments:

1. State Level: State Monitoring cum Technical Advisory Committee (SMTAC)

2. District Level: District Monitoring cum Technical Advisory Committee (DMTAC)

3. For the institute: Quality Team/ Infection Control Committee/ Bio Medical Waste Management Committee

XI. SPILL MANAGEMENT PROCEDURES:

Healthcare Facilities have to ensure environmentally sound management of mercury or other chemical spills. In case of mercury spill, the following steps as given in CPCB guidelines on "Environmentally Sound Techniques for Mercury Waste Generated from Healthcare Facilities" shall be followed as in the Annexures.

XII. DO'S AND DON'TS for Institute

Do's:

1. Segregate biomedical waste at the source of generation itself in colour coded containers/ bags as per BMWM Rules, 2016 and its amendments.
2. Use same coloured container as that of colour coded bags according to waste category
3. Pre-treat only the infectious microbiology, biotechnology and other clinically laboratory waste.
4. Use separate yellow coloured bag with Cytotoxic symbol for disposal vials, ampoules, gloves, IV sets etc. contaminated with cytotoxic drugs.
5. Wash the bins with detergent or soap and water periodically
6. Collect the organic waste such as leftover food, fruit peels, etc., in green coloured wet bin, meant for general waste
7. Use only compostable bags in green coloured wet bin, meant for general waste.
8. Collect the dry solid waste such as papers, wrappers, plastic bottles, etc. in blue coloured dry bin, meant for general waste.
9. Transport the bio-medical waste from source of generation to central collection room in closed trolleys only.
10. Transport waste through a pre-defined route within the hospital.
11. Ensure that entire biomedical waste is handed over to common facility for necessary treatment and disposal.
12. Ensure that the colour coded bag has bio-hazard symbol, label and bar-coded label.
13. Remove plastic bags when ¾ full, tie the bags properly. Ensure bag is properly tied/ sealed to avoid spillage.
14. Provide Personal Protective Equipment to housekeeping staff handling biomedical waste.
15. Maintain records with regard to bio-medical waste management vis-à-vis waste generation, storage, treatment & disposal.
16. Knot or lock string the filled bags lightly so as to avoid the spillage.
17. Disinfect and cut the waste mattresses into 4 to 6 pieces prior to disposal
18. Collect needles / syringes with fixed needles in white coloured containers.
19. Collect empty glass vials or empty glass ampoules in puncture proof blue containers and handover the box to CBMWTF.
20. Disinfect the liquid waste from laboratory prior to mixing the same with hospital effluent.
21. Collect used sanitary waste like diapers or sanitary napkins generated from wards (patient area) into yellow coloured bag.
22. Collect sanitary waste wrapped (in pouches or suitable wrapping material) generated from public toilets in dry solid waste bins (blue bins) as part of general waste.

23. Sell or handover E-Waste and used lead acid batteries only to registered recyclers or authorized collection centres.
24. Report to SPCBs in case waste is not picked up regularly by common facility.
25. Paste placards or postures for bio-medical waste segregation in the wards and collection centres.

Don'ts

1. Never mix bio-medical waste with general waste.
2. Don’t use chlorinated plastic bags for collection of biomedical waste
3. Never store infectious microbiology, biotechnology and other clinically laboratory waste beyond 48 hours.
4. Don’t set-up on-site or captive treatment facility in case a common facility exists at a distance of 75 Kms.
5. Don't dispose sharps (used syringes with needles, broken glass, scalpels etc.) into yellow or red coloured bags.
6. Don’t dispose plastic waste into yellow-coloured bags
7. Don’t fill the bags
8. Don’t handle waste without Personal Protective Equipment such as protective clothing, gloves, masks, shoe etc.
9. Don’t drag the bags after removal. (Bags can burst and the site could be repulsive)
10. Don’t fill more than 20kg of biomedical waste in a bag.
11. Don’t sell/dispose/auction used linen/ bed-sheets without disinfection
12. Don’t handover plastic waste to un-authorized persons.
13. Don’t keep lid of the waste bins in open condition
14. Don’t use the lift meant for patients for intra-mural transportation of biomedical waste.

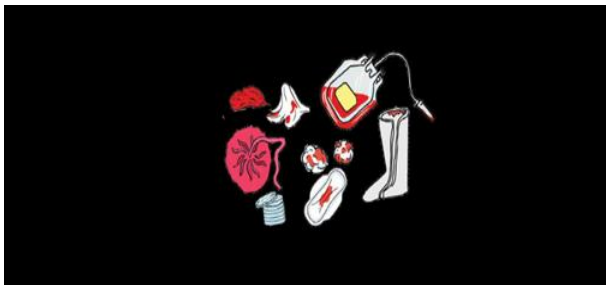
XIII. REFERENCES:

1. Bio-Medical Waste Management Rules, 2016 vide G.S.R. NO 343(E), dated 28th March, 2016
2. Bio-Medical Waste Management Amendment Rules, 2018 vide G.S.R. 234 (E), dated 16th March, 2018
3. Bio-Medical Waste Management Amendment Rules, 2019 vide G.S.R NO. 129 (E), dated 19th February, 2019
4. Bio-Medical Waste Management (Second Amendment) Rules, 2019 vide G.S.R NO. 360 (E), dated 10th May, 2019
5. Guidelines for Management of Healthcare Waste as per Biomedical Waste Management Rules, 2016 by DGHS & CPCB
6. Pictorial guide on biomedical waste management rules 2016 (amended in 2018 & 2019)
7. TOOLKIT Bio-Medical Waste Management Rules, 2016, 1st Edition, 2019
8. Manual for Bio-Medical Waste Management, AIIMS, New Delhi
9. **"**Environmentally sound management of mercury waste generated from the health care facilities" by CPCB published on 31st January, 2012

XIV. PICTORIAL PRESENTATION

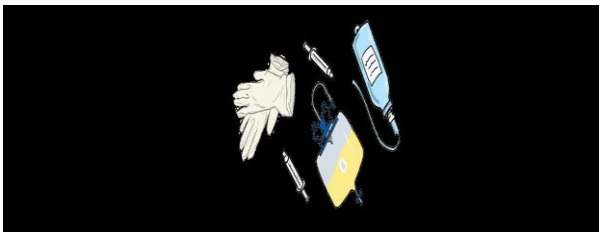
PICTORIAL GUIDE ON BIOMEDICAL WASTE MANAGEMENT RULES 2016
(AMENDED IN 2018 & 2019)

Place hospital biomedical waste in designated colour coded biomedical waste collection bins



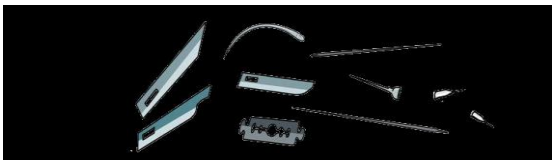
Anatomical waste, chemical waste, soiled waste, chemotherapy waste, discarded linen and medicines and laboratory waste (Yellow)

Human & animal anatomical waste, liquid waste and other biological infectious waste (Pre-treat petri dishes and blood bags)



Contaminated plastic waste (Red)
Disposable items such as tubing, plastic bottles, intravenous tubes and catheters, cannulas, syringes without needles

Glass waste and metallic implants (Blue)
Glassware such as broken and discarded vials, bottles, slides, glass petri dishes etc.



Metal sharps: Waste sharps such as needles and blades (in puncture proof container)

NEVER MIX WASTE DURING COLLECTION AND TRANSPORTATION

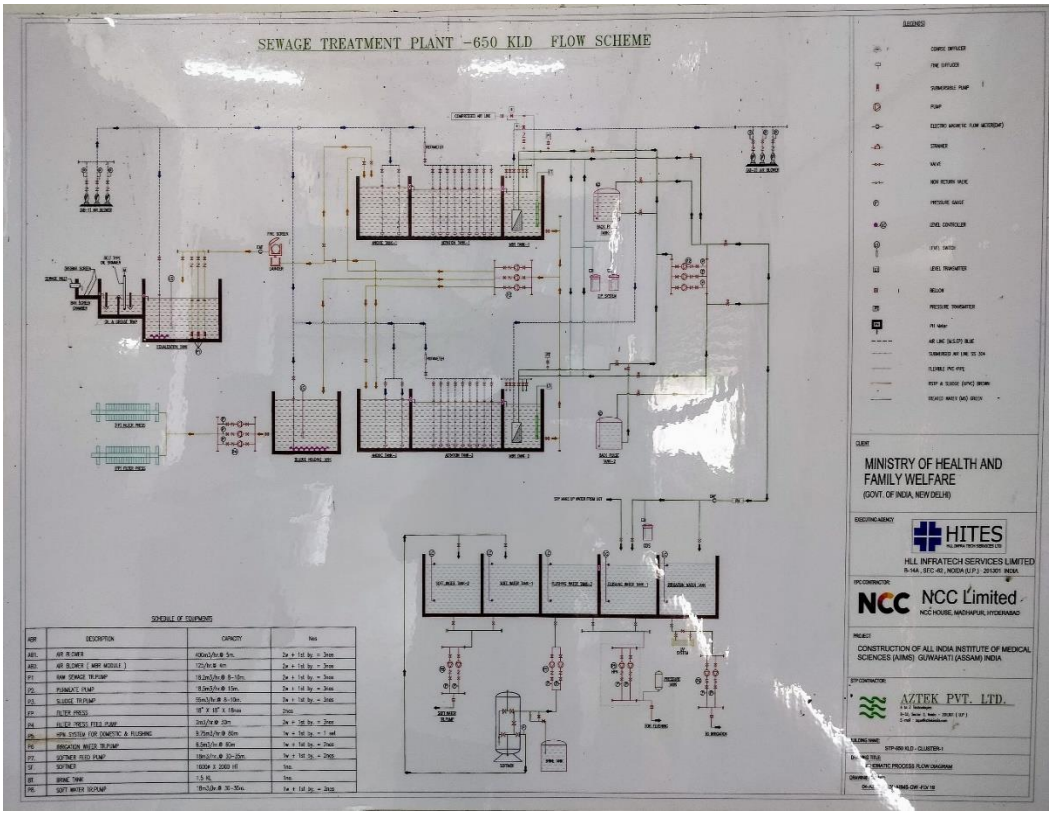
Collect dry and wet general waste separately

Store and transport general waste separately

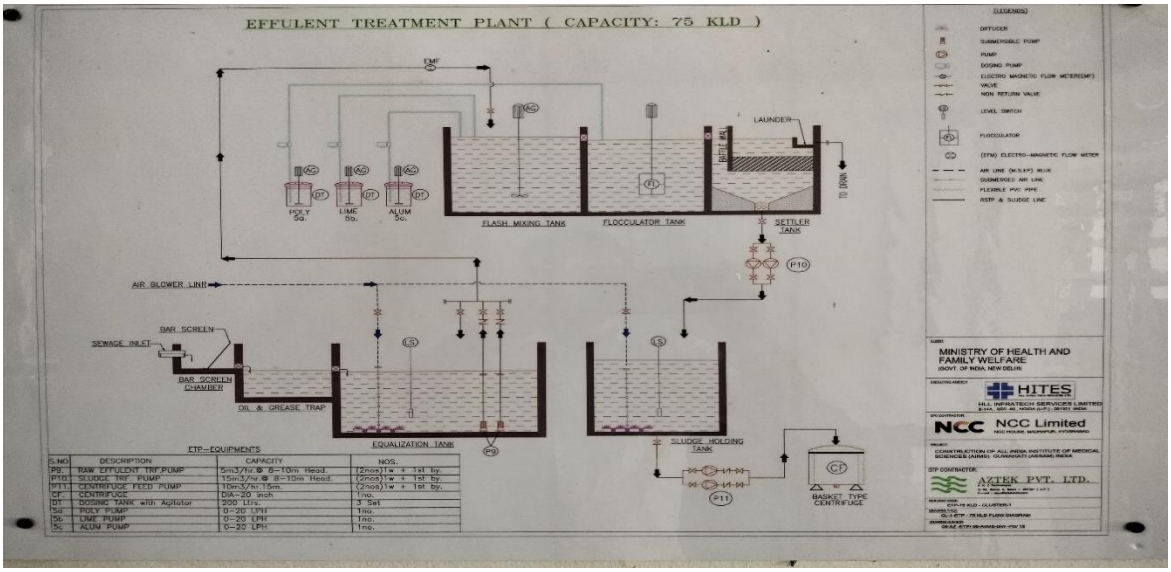
Bar Code System for Effective Management of Bio-medical Waste:

Digital Weighing Machine and Bar Code Scanner

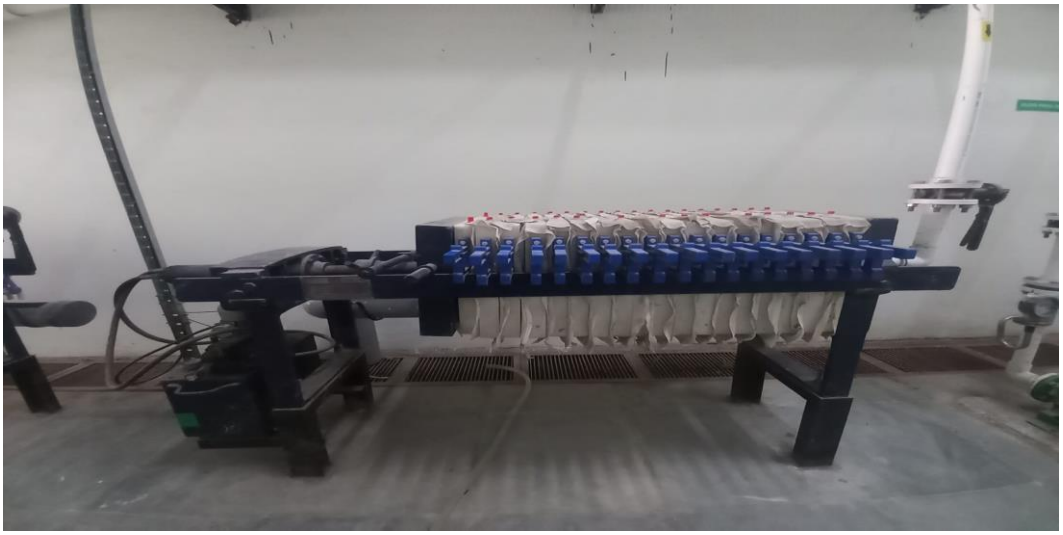
Transportation of biomedical waste by vehicle of **Common Bio Medical Waste Treatment Facility (CBWTF)**



Sewage Treatment Plant 1 & 2 with 650 & 250 KLD capacity



Effluent Treatment Plant with 75 KLD capacity



Plantation Drive

SWACHHTA PLEDGE

Training on Biomedical Waste Management

3 Bucket Mopping System

Swachhata pakhwada

Recognizing the best performing staff

AIIMS Guwahati, Biomedical Waste Building

Annexure I

Specifications for Plastic Bags & Containers

Plastic Bags

- HCFs must ensure that use of chlorinated plastic bags for waste collection must be phased out. Plastic bags used for collection of biomedical waste should be as per the BIS standards or Plastic Waste Management Rules, 2016

- As per the Plastic Waste Management Rules, 2016, each plastic bags must have labelling and marking as follows:

o Name and Registration number of manufacturer and thickness of the bag

o Type of material

- Each Plastic Bags must bear a label of "Recycle" as per its compositions

- In case of use of compostable plastic bags, there should be a label "COMPOSTABLE" and shall conform to the Indian Standard: IS or ISO 17088:2008 titled as Specifications for "Compostable Plastics".

- Each Non-chlorinated plastic bags must be at least of 50-micron width. Thickness criteria would not apply in case of compostable plastic bags.

Containers

- For containers being used for collection of sharps and glassware the containers must meet the requirements as listed by World Health Organization (WHO) in "PQS Performance Specifications: Safety Box for disposal of waste sharps" (Source: Document number: WHO/PQS/E10/SB01.1).

Note: BIS standards shall be applicable for plastic bags and containers as and when published by BIS

Annexure II

Format for Bio Medical Waste Register/Record

NAME & ADDRESS OF HEALTH CARE FACILITY BIO MEDICAL WASTE REGISTER/ RECORD FORMAT										
S. No.	Date of Generation	Quantity of BMW Generated (in KG) Color Coding & Category					Date of Collection by Waste Collection Agency	Time (in AM/PM)	Name & Signature of Waste Collector	Name & Signature of HCF Staff
		Yellow (1)	Red (2)	White (3)	Blue (4)	Total				
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

ANNEXURE III

ACCIDENT REPORTING

FORM I

[(see Rule 4(o), 5(i) and 15 (2)]

ACCIDENT REPORTING

1. Date and time of accident:

2. Type of accident:

3. Sequence of events leading to accident:

4. Has the Authority been informed immediately:

5. The type of waste involved in accident:

6. Assessment of the effects of the accident on human health and the environment:

7. Emergency measures taken

8. Steps taken to alleviate the effects of accident:

9. Steps taken to prevent the recurrence of such an accident: ……

10. Does the facility has an Emergency Control Policy? If yes give details:

Date ..... Signature .....

Place.....

Designation.....

ANNEXURE IV

FORM II

APPLICATION FOR AUTHORIZATION OR RENEWAL OF AUTHORIZATION

(To be submitted by occupier of health care facility or common bio-medical waste treatment facility)

To

The Prescribed Authority

(Name of the State or UT Administration)

Address:

1. Particulars of Applicant:

(i) Name of the Applicant:

(In block letters & in full)

(ii) Name of the health care facility (HCF) or common bio-medical waste treatment facility (CBWTF)

(iii) Address for correspondence:

(iv) Tele No., Fax No.:

(v) Email:

(vi) Website Address:

2. Activity for which authorization is sought:

Activity	Please tick
Generation, segregation	
Collection,	
Storage	
Packaging	
Reception	
Transportation	
Treatment or processing or conversion	
Recycling	
Disposal or destruction	
Offering for sale, transfer	
Any other form of handling	

3. Application for fresh or renewal of authorization (please tick whatever is applicable):

(i) Applied for CTO/CTE Yes/No

(ii) In case of renewal previous authorization number and date:---------- ------
(iii) Status of Consents:

a) Under the Water (Prevention and Control of Pollution) Act, 1974:_____

b) Under the Air (Prevention and Control of Pollution) Act, 1981:_____

4. (i) Address of the health care facility (HCF) or common bio-medical waste treatment facility (CBWTF):

(ii) GPS coordinates of health care facility (HCF) or common bio-medical waste treatment facility (CBWTF):

5. Details of health care facility (HCF) or common bio-medical waste treatment facility (CBWTF):
I. Number of beds of HCF:

II. Number of patients treated per month by HCF:

III. Number healthcare facilities covered by CBWTF: _____

IV. No of beds covered by CBWTF: _____

V. Installed treatment and disposal capacity of CBWTF:_____ Kg per day

VI. Quantity of biomedical waste treated or disposed by CBWTF:_____ Kg/ day

VII. Area or distance covered by CBWTF:_____ (Please attach map a map with GPS locations of CBWTF and area of coverage)

VIII. Quantity of Biomedical waste handled, treated or disposed:

Category	Type of Waste	Quantity Generated or collected, kg/day	Method of Treatment and Disposal(Refer Schedule-I)
1	2	3	4
YELLOW	a) Human Anatomical Waste		
	b) Animal Anatomical Waste		
	c) Soiled Waste		
	d) Expired or Discarded Medicines		
	e) Chemical Solid		
	g) Discarded linen, mattresses, beddings contaminated with blood or body fluid		

	h) Microbiology, Biotechnology and other clinical laboratory waste		
RED	Contaminated Waste (Recyclable)		
WHITE	Waste sharps including Metals:		
BLUE	Glassware		
	Metallic Body Implants		

6. Brief description of arrangements for handling of biomedical waste (attach details):

i. Mode of transportation (if any) of bio-medical waste:

ii. Details of treatment equipment (please give details such as the number, type & capacity of each unit)

Treatment Equipment	Number of Units	Capacity of each unit
Incinerators		
Plasma Pyrolysis		
Autoclaves		
Microwave		
Hydroclave		
Shredder		
Needle tip cutter or destroyer		
Sharps encapsulation or concrete pit		
Deep burial pits		
Any other treatment equipment		

7. Contingency plan of common bio-medical waste treatment facility (CBWTF)(attach documents):

8. Details of directions or notices or legal actions if any during the period of earlier authorization

9. Declaration

I do hereby declare that the statements made and information given above are true to the best of my knowledge and belief and that I have not concealed any information. I do also hereby undertake to provide any further information sought by the SPCB in relation to these rules and to fulfill any conditions stipulated by the SPCB

Date: Signature of the Applicant

Place: Designation of Applicant

ANNEXURE V

FORM IV: ANNUAL REPORT

Sl. No.	Particulars of Occupier		
1	Particulars of the Occupier		
	(i) Name of the authorized person (occupier of facility)		
	(ii) Name of HCF		
	(iii) Address for Correspondence	:	
	(iv) Address of Facility	:	
	(v)Tel. No, Fax. No	:	
	(vi) E-mail ID	:	
	(vii) URL of Website	:	
	(viii) GPS coordinates of HCF or CBMWTF	:	
	(ix) Ownership of HCF or CBMWTF	:	
	(x). Status of Authorization under the Bio-Medical Waste (Management and Handling) Rules	:	
	(xi). Status of Consents under Water Act andAir Act	:	
2	Type of Health Care Facility	:	
	(i) Bedded Hospital	:	
	(ii) Non-bedded hospital		

	Clinical Laboratory or Research Institute orVeterinary Hospital or any other)		
	(iii) License number and its date of expiry		
3	Details of CBMWTF		
	(i) Number of health care facilities covered by CBMWTF		
	(ii) No. of Beds covered by CBMWTF		
	(iii) Installed treatment and disposalcapacity of CBMWTF;		
	(iv) Quantity of bio medical waste treated or disposed by CBMWTF		
4	Quantity of waste generated or disposed inKg per Annum (on monthly average basis)		*Yellow Category: Kg/Annum*
			Red Category: Kg/ Annum
			White: Kg/ Annum
			Blue Category: Kg/ Annum
			General Solid Waste: Kg/ Annum
5	Details of the Storage, Treatment, Transportation, Processing and Disposal Facility		
	(i) Details of the on-site storage		Size:
			Capacity:
			Provision of on-site storage: (cold storage or any other provision)

	(ii) Disposal facilities		**Type of treatment equipment**	**No ofUnits**	**Capacity Kg/day**
			Incinerators		
			Plasma Pyrolysis		

			Autoclaves		
			Microwave		
			Hydroclave		
			Shredder		
			Needle tipcutter or destroyer		
			Sharps		
			Encapsulationor concrete pit		
			Deep burial pits		
			Chemical disinfection:		
			Any othertreatment equipment:		
	(iii) Quantity of recyclable wastes sold to authorized recyclers after treatment in Kg per annum	:	Red Category (like plastic, glass, etc.		
	(iv) No. of Vehicles used for collection and transportation of biomedical waste	:			
	(v) Details of incineration ash and ETP sludge generated and disposed during the treatment of wastes in Kg per annum			Quantity Generated	Where disposed
			Incineration		
			Ash		
			ETP Sludge		
	(vi) Name of the Common Bio-Medical Waste Treatment Facility				

	Operator through which wastes are disposed of		
	(vii) List of members HCF not handed over bio-medical waste.		
6	Do you have bio-medical waste management committee? If yes, attach minutes of the meetings held during the reporting period		

7	Details trainings conducted on BMW		
	(i) Number of trainings conducted on BMW Management		
	(ii) Number of personnel trained		
	(iii) Number of personnel trained at the time of induction		
	(iv) Number of personnel not undergone any training so far		
	(v) Whether standard manual for training is available?		
8	Details of the accident occurred during the year		
	(i) Number of Accidents occurred		
	(ii) Number of persons affected		

	(iii) Remedial Action taken (Please attach details if any)		
	(iv) Any Fatality occurred, details		
9	Are you meeting the standards of air Pollution from the incinerator? How many times in last year could not met the standards?		
	Details of Continuous online emission monitoring systems installed		
10	Liquid waste generated and treatment methods in place. How many times you have not met the standards in a year?		
11	Is the disinfection method or sterilization meeting the log 4 standards? How many times you have not met the standards in a year?		
12	Any other relevant information		

Certified that the above report is for the period from _____

Name and Signature of the Head of the Institution

Date:

Place:

ANNEXURE VI

FORMAT FOR EMPLOYEE HEALTH CHECK UP

Designation…… Date……UHID No……..

Name:…….……..S/O,/D/O,W/O:……

Age/Sex…..Marital Status :…….. Blood group……Rh……...

Contact No:……..

Address:..…….

E-Mail:.……...

Present complaints with duration (if any):

1.

2.

3.

Vaccination history (Especially w.r.t Hepatitis-B and Tetanus):

Whether vaccination ever received in past? Yes/ No

Name of Vaccine	First dose	Second Dose	Third Dose	Booster	Booster	Booster	Booster
Hepatitis-B							
Tetanus Toxoid							

Past medical history (if any):

Hypertension	Yes	No	Since When	Diabetes	Yes	No	Since When
Asthma	**Yes**	**No**	**Since When**	**Arthritis**	**Yes**	**No**	**Since When**
Tuberculosis	**Yes**	**No**	**Since When**	**Allergies**	**Yes**	**No**	**Since When**
Cancer	**Yes**	**No**	**Since When**	**Others**	**Yes**	**No**	**Since When**

Surgical history (if any):

GENERAL PHYSICAL EXAMINATION:

General appearance……
Oedema/Pallor/Cyanosis/Jaundice/Clubbing/Lymph Nodes…….

Pulse……..BP…… Height……cm, Weight……kg,

Oral hygiene …….

SYSTEMIC EXAMINATION:

Cardiovascular:

System Respiratory:

System Central Nervous System:

Gastrointestinal System:

Urogenital System:

Gynae. & Obstet (In case of Females)

Gravida	Para	Abortions

Musculoskeletal System:

ENT:

Eye:

INVESTIGATIONS:

Lab Tests:

Hb	TLC	DLC	RBS	Bl. Urea	S. Creatinine
		P L M E			

Urine:

Stool:

ECG:

Others

Radiological examination:

X- Ray Chest PA view:

USG (If Required)

CT scan/MRI (If required)

Others:

Inference with Diagnosis, if any

Advice / Recommendations/ Intervention done

Name and signature of doctor

Follow-up:

ANNEXURE VII

Preparation of Hypochlorite Solution

Preparation of Chlorine Solution Using Concentrated Solution

Concentration of commercially available hypochlorite solution	Required Chlorine concentration	To Prepare 1000 ml	
		Solution in ml	Add water in ml
5%	1 %	200	800
	2%	400	600
10%	1 %	100	900
	2%	200	800

Preparation of Chlorine Solution Using Bleach Powder Solution

Strength of Stable Bleaching Powder (SBP)	Volume of Water	Desired Concentration	Bleaching powder in grams per litre
20%	1 L	1%	50
		2%	100
25%	1 L	1%	40
		2%	80
30%	1 L	1%	33
		2%	67

ANNEXURE VIII

INDICATORS FOR MONITORING BMW ACTIVITIES IN THE STATE/ DISTRICT

Indicators for Monitoring of BMW Activities in the State/District

Indicators for State/District Level Monitoring

1. Percentage of Health care facilities having valid authorization from SPCB:
   Number of Facilities having valid authorization / Total Number of HCFs in State X100
2. Percentage of Health care facilities under agreement with CBWTF:
   Number of HCFs having agreement with CBWTF/ Total Number of HCFs in State X 100
3. Category wise waste generated per bed

S. No.	Category of Waste	Total Quantity of water (a)	Total Number of Beds (b)	Waste Generated/ Bed (a/b)
1	Yellow			
2	Red			
3	Blue			

4. Total number of facilities granted authorization by SPCB / Total Number of facilities applied for authorization
5. Total Number of Accidents Reported while BMW Handling
6. Total Number of Trainings conducted for BMW

ANNEXURE IX

General Standards for discharge of Wastewater into Public Sewers

S. No.	Parameter*	Standards for discharge in Public Sewers
1.	Suspended solids mg/l, Max.	600
2.	pH Value	5.5 to 9.0
3.	Oil and grease mg/l Max.	20
4.	Biochemical Oxygen demand 1[3 days at 27oC] mg/l max.	350
5.	Chemical Oxygen Demand in mg/l	Not applicable
6.	Bio-assay test	90% survival of fish after 96 hours in 100% effluent

** Standards for Parameters stipulated in Schedule II of BMWM Rules, 2016 are specified for discharge into public sewers by healthcare facilities.*

ANNEXURE X

Log Book for Operating the Autoclave:

Date	Time of operation of the Autoclave		Batch number	Quantity of waste feeding per batch in Kg (Total waste treated by autoclaving in Kg)	Temperature and Pressure in every ten minutes		Strip test result (pl. paste the strip test for each batch with a proof)	Consumption of electricity (indicate electricity meter reading)		Net Quantity of waste received in Kg	Net Quantity of Waste left over in Kg
	Start	End			Temperature in O C	Pressure in psi		Initial reading	Final reading		
1	2	3	4	5	6	7	8	9	10	11	12

ANNEXURE-XI

SPILL MANAGEMENT

(Spill of blood/ body fluids / chemicals)

General recommendations:

1. Small spills (<10 ml) should be managed with one step procedure. Wearing heavy duty gloves contamination should be wiped up with an absorbable material soaked in freshly prepared 1% sodium hypochlorite solution.

2. Large spills: (>10 ml)

- Cordon off the area.
- Appropriate personal protective equipment (PPE) should be worn for cleaning up a blood/ body fluid spill.
- Heavy duty gloves should be worn during cleaning and disinfecting procedures.
- If the possibility of splashing exists, the worker should wear a face mask and goggles.
- Gown, boots/ protective shoe covers should be worn.
- The blood/ body spill area must be cleaned of obvious organic material. The organic material should be first removed and be discarded it in a yellow plastic waste bag.
- After removing organic material, the area should be covered with absorbable material such as paper or cloth and 1% freshly prepared sodium hypochlorite solution is poured over the spread and left for 10-15 minutes, then wipe and discard the material in a yellow-coloured biomedical polythene bag.
- After decontamination, thorough cleaning of the floor with soap and water is necessary.

- The treated area should be cleaned and allow it to dry.
- Incident reporting to be done

SPILLAGE KIT: The kit contains PPE (Mask, Cap, Shoe cover, Heavy duty gloves, disposable gown, goggles, and gum boots), yellow polyether bag, absorbable materials (paper/waste cloth/duster), freshly prepared 1% sodium hypochlorite solution, cleaning up scoop and scrapper, caution board.

ANNEXURE-XII

MERCURY SPILL MANAGEMENT

'Mercury Spill Kits':

1. Personal protective equipment (PPE),
2. Air-tight, sealable plastic bags (small and large sizes, thickness 40 to 150 microns),
3. Small, air-tight, rigid plastic container or glass bottled half filled with some water or vapour suppression agent for collecting elemental mercury.
4. Air-tight, puncture-resistant, rigid plastic or steel jar or container with a wide opening for collecting mercury-contaminated broken glass.
5. Plastic tray
6. Regular plastic waste bags (thickness: 40 to 150 microns).
7. Tools required for removing mercury:

   ♣ Flashlight (electric torch) to locate shiny mercury beads.

   ♣ Plastic-coated playing cards or thin pieces of plastic to push mercury beads into a plastic scoop or pan; if these are not available, use index cards, pieces of cardboard, or stiff paper.

   ♣ Small plastic scoop or plastic dust pan to catch the mercury beads.

   ♣ Tweezers to remove small broken glass pieces.

   ♣ Eyedropper or syringe (without the needle) to raw up large mercury beads.

♣ Duct tape or sticky tape to pick up tiny mercury droplets.

8. Vapour suppression agents:

   ♣ Sulfur powder (available from pharmacies) to absorb mercury by forming mercuric sulfide (or Zinc /copper flakes to absorb mercury by forming amalgams).

   ♣ Commercial absorbent pads or vapour suppressants which contain a foam pad saturated with a suspension containing small amounts of sodium thiosulphate, copper sulphate, calcium chloride, and potassium iodide.

   Small quantities of a propylene glycol solution or sodium thiosulphate or copper sulphate may also be used as vapour suppression agents.

9. Brush to remove powder or flakes.
10. Utility knife blade.
11. Materials for decontamination:

    Vinegar, hydrogen peroxide, and cotton swabs for final cleaning when using sulfur powder.

    Decontaminant solution or commercial decontaminant (made of 10 % sodium thiosulphate solution or a mixture of sodium thiosulphate and EDTA).

Suggested steps for mercury spill clean-up in HCFs: Step-by-step instructions that are specific to the health care facility are given in subsequent paras:

1. Evacuate area & cordon off the area
2. Use personal protective equipment (PPE)
3. Remove ring/jewelry (mercury binds with the metal).
4. Locate mercury beads: Locate all mercury beads and look for mercury in any surface

cracks or in hard-to-reach areas of the floor. Check a wide area beyond the spill. Use the flashlight to locate additional glistening beads of mercury that may be sticking to the surface or in small cracked areas. Cardboard sheets should be 'used to push the spilled beads of mercury together'.

5. Use syringe without a needle/eyedropper and sticky tape: A syringe (without a needle) shall be used to suck the beads of mercury. Collected mercury should be placed slowly and carefully into an unbreakable plastic container/glass bottle with an airtight lid half filled with water. After removing larger beads, use sticky tape to collect smaller hard-to-see beads. Place the sticky tape in a punctured proof plastic bag and secure properly. Commercially available powdered sulfur or zinc stains mercury a darker colour and can make smaller beads easier to see (powder sulfer may be used because (i) it makes the mercury easier to see since there may be a colour change from yellow to brown and (ii) it binds the mercury so that it can be easily removed and suppresses the vaporization of any missing mercury).
6. Collection in leak-proof bag or container: Place all the materials used during the clean-up, including gloves, mercury spills collected from the spill area into a leak-proof plastic bag or container with lid and sealed properly and labelled as per these guidelines and such collected waste should be stored in a designated area only.
7. Cleaning of the floor surfaces contaminated with mercury and cleaning of room surfaces: Sprinkle sulphur or zinc powder over the area. Either powder will quickly bind any remaining mercury. In case, zinc powder is used, moisten the powder with water after it is sprinkled and use a paper towel to rub it into cracks in the flooring. Use the cardboard and then dampened paper towels to pick up the powder and bound

mercury. Place all towels and cardboard in a plastic bag and seal all the bags that were used and store in a designated area.

8. All the mercury spill surfaces should be decontaminated with 10 % sodium-thiosulfate solution. Keep a window open to ventilate after the clean-up. After ensuring all the mercury has been removed, resume normal vacuuming and utilise the cleaned area for routine operation
9. Labelling: All the bags or containers containing items contaminated with mercury should be marked properly and labelled as per these guidelines

   Marking of Mercury Waste Container

   HAZARDOUS WASTE

   * Handle with Care

Waste category No:	**Compatible Group:**
Total Quantity:	Date of Storage:
Contents and State of the Waste	
Sender's Name & Address	Receiver's Name & Address
Phone	Phone .....
E-mail.....	E-mail .....
Tel. & Fax No	Tel.& Fax No .....
Contact Person	Contact Person .....
In case of emergency please contact …….	

Note:

i. Background colour of lab I fluorescent yellow,

ii. The words ‘HAZARDOUS WASTES’ & ‘HANDLE WITH CARE’ to be prominent and written in red in Hindi, English and in Vernacular Language

iii. Label should be of non-washable material.

10. To inform the higher authority for further disposal through CBWTF.

ANNEXURE-XIII

NEEDLE STICK INJURY PROTOCOL

1. Do not panic.

3. Do not put the pricked finger in mouth or squeeze the wound to bleed.

2. Immediately, wash the wound and surrounding skin with soap and running water for 5 minutes.

4. Do not scrub or use bleach, chlorine, alcohol, povidone iodine any antiseptic/chemicals

5. Identify the source/patient involve so that evaluation for infection can be done.

6. Report to emergency duty doctor, fill up the standard form available and enter in Needle Stick Injury Register.

The Evaluation for Post Exposure Prophylaxis (PEP) to be done by designated PEP I/C at ICTC/ Emergency Doctor, preferably within 2 hours but certainly within 72 hours. The first dose of PEP should be administered preferably within 2 hours but certainly within 72 hours.

Management and follow up of the needle stick injury shall be as per the SOP

ANNEXURE XIV

Roles & responsibilities of staff:

Heads of Department/ In-charge:

1. Ensuring all staff posted in the department are trained on biomedical waste rule 2016 and its amendment thereof, solid waste management rule 2016, E-waste management rules 2016 and its amendment thereof.
2. Ensuring annual health check-up of staff posted in the department & their vaccination as per BMW rule.
3. Ensuring all the faculties, residents, trainee doctors and interns are trained in adopting correct segregation practices and make regular inspections to see that they are following it properly.
4. Root cause analysis and corrective & preventive actions of accident reporting as per BMW Rules.
5. Ensuring that nursing officers are indenting and arranging all requisite items for biomedical waste management.

Consultants & Residents:

1. Appropriate Segregation
2. Annual Health Check-up & Vaccination
3. Knowledge on needle stick injury protocol

Hospital Administrators:

1. Compliance with all sections of the BMW Rules, 2016
2. Application, Authorization and renewal of Authorization
3. Supervision and auditing at frequent intervals
4. Constitution of biomedical waste management committee and holding regular meeting
5. Intimating the engineering section for proper functioning of ETP & STP
6. Intimating the procurement cell for tenders & entering agreement **regarding collection, transportation and treatment of biomedical waste.**

Nursing In-charge & Nursing Officers:

1. Proper segregation of biomedical waste
2. Supervision of housekeeping and hospital attendant
3. Maintaining spill management kits
4. Maintaining daily cleaning checklist
5. Incident reporting
6. Indenting and maintaining logistics for biomedical waste management
7. Ensuring needle stick protocol is followed
8. Ensuring annual health check-up and vaccination
9. Attending training on biomedical waste management
10. Educating patient/ their attendants on segregation and proper disposal of waste in the hospital.

Infection control officer & Infection control Nurses:

1. Creating awareness of staff on biomedical waste management manual of AIIMS, Guwahati
2. Maintaining data records and reporting
3. Regular rounds and audits
4. Supervision of vaccination and health status of health care workers
5. Training of all health care staff in adopting correct practices on segregation and handling of biomedical waste.

Hospital/ Sanitary Attendant:

1. Timely emptying of colour coded bio-medical waste collection bins
2. Putting appropriate polythene bags on the colour coded BMW collection bins
3. Informing the nursing officer/ supervisor while observing any improper segregation of biomedical waste
4. He/ She should know the correct way of wearing PPE and correct method of spill management.
5. They must have the correct knowledge on needle stick injury protocol
6. Cleaning of BMW bins daily/ whenever required, as per protocols
7. They should ensure that the bags are not more than 2/3rd full.
8. They should ensure that annual health check-up and vaccination is done.