



BIOMEDICAL WASTE MANAGEMENT

Author 1 - Shally Sharma, Nursing Tutor, Govt. Nursing College Gangyal, GMCH Jammu

Co Author 1- Dr. Dara Singh ,Medical Superintendent, GMCH Jammu

Co Author 2- Dr. Rehana Khurshid , Deputy Medical Superintendent , GMCH Jammu.

ABSTRACT

Biomedical waste, if improperly disposed, is a pertinent health risk to the hospital staff, patients, attendants as well as the general population. It can not be overemphasized that proper and effective management of biomedical waste is a pertinent public health priority.

This evidence-based manual incorporates all aspects related to Biomedical waste management as envisaged in the Biomedical Waste Management Rules, 2016 as well as the Biomedical Waste Management (Amendment) Rules, 2018. The Manual is beautifully organized with What, Where, Why, When, Who and How about the Biomedical Waste Management in healthcare facilities. It covers legal and administrative framework, key roles and responsibilities of stakeholders, as well as step-wise implementation plan for biomedical waste management at healthcare facilities. Improper management of health care waste can have both direct and indirect consequences in the form of toxic emissions from inadequate burning of medical waste .Biomedical waste must be properly managed and disposed of to protect the environment, general public and health care workers. Steps in the management of Biomedical waste include generation, accumulation, handling, storage, treatment, transport and disposal.

INTRODUCTION

According to World Health Organization, Health-care waste includes all waste generated by health-care establishments, research facilities, and laboratories. It also includes waste produced in the course of health care undertaken in the home (dialysis, insulin injections, etc.).

• Between 75 to 90 % of waste generated at healthcare facilities is “general” or non-hazardous waste. It includes waste generated during:

- Administrative activities
- Housekeeping activities
- kitchen & food related
- Packaging
- Maintenance functions

• Only 10 to 25% of waste generated during delivery of patient care is “hazardous” in nature and carries various health risks. This hazardous or biomedical waste includes:

- Infectious waste cultures
- Sharps
- Pathological waste
- Pharmaceutical
- Genotoxic
- Chemical and radioactive waste

WHERE

IS BIOMEDICAL WASTE GENERATED

Within healthcare facilities, different work areas generate different types of biomedical wastes. Broadly waste is generated in operation theatres & surgical wards, medical wards, laboratories, pharmaceutical & chemical stores, and dental clinics.

WHY

SHOULD BIOMEDICAL WASTE BE SEGREGATED, TREATED & DISPOSED

Anyone who either generates, handles or disposes biomedical waste or comes in contact due to accidental exposure is exposed to the risk of infection. The key risk groups include medical doctors, nurses, health-care auxiliaries, hospital maintenance personnel, visitors to health-care establishments, patients in health-care establishments or receiving home care, workers in support services allied to health-care establishments, such as laundries, waste handling, and transportation, and workers in waste disposal facilities (such as landfills or CBWTFs), including scavengers.

WHEN

SHOULD BIOMEDICAL WASTE BE SEGREGATED

BMW should be segregated at the POINT OF GENERATION.

If this is not done, it can result in:

- Infecting all waste (including general uninfected waste).
- It is very difficult to segregate BMW after it has got mixed.
- Increases risk of injury and infection for persons engaged in waste handling.

Who should segregate Biomedical waste

Person generating the waste should segregate it like

- Doctors
- Nursing staff
- Paramedical staff
- Sanitary staff
- Ward boy
- Lab. Technicians
- Patient
- Lab.technicians

- Ward boy

CLASSIFICATION OF BIO_MEDICAL WASTE AS PER BIO MEDICAL WASTE MANAGEMENT RULES, 2016

Bio Medical Waste Management Rules, 2016 categorizes the Bio medical waste generated from the health care facility into four categories based on the segregation pathway and color code. Various types of Bio medical waste is 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:

1. **Infectious waste:** Waste contaminated with blood and other bodily fluids, cultures and stock of infectious agents from laboratory worker waste from patients with infections(e.g swabs, bandages and disposable medical devices)
2. **Pathological waste:** Human tissues, organism fluids, body parts .
3. **Sharps waste:** Syringes, needles, disposable scalpels and blades etc.
4. **Chemical waste:** for example solvents and reagents used for laboratory preparations, disinfectants,sterilants .
5. **Pharmaceutical waste:** Expired, unused and contaminated drugs and vaccines.
6. **Cytotoxic waste:** Waste containing substance with genotoxic properties such as cytotoxic drugs used in cancer treatment and their metabolites.
Radioactive waste: Such as products contaminated by radionuclides including radioactive diagnostic material or radiotherapeutic materials.
7. **Non-Hazardous or general waste:** Waste that does not pose any particular biological, chemical, radioactive and physical hazard.

WASTE MANAGEMENT: Reasons for failure

Lack of awareness about health hazards related to health care waste, inadequate training in proper management, absence of waste management and disposal system , insufficient financial and human resources.

WHO developed the first Global and comprehensive guidance document '**Safe management of Waste from health care activities**'.WHO Guidance documents on health care waste are also available including:

- A monitoring Tool
- A cost assessment tool
- A rapid assessment tool
- A policy paper
- Guidance to develop national Plans
- Management of waste from injection activities
- Management of waste at primary health care centres.
- Management of waste from mass immunization activities and
- Management of waste in emergencies.

SAFETY MEASURES:

A). STANDARDS FOR DEEP BURIAL

- Yellow wastes namely human anatomical, animal anatomical and soiled waste are permitted for deep burial only in rural or remote areas where there is no access to common bio-medical waste treatment facility after obtaining authorization from SPCB/PCCs.
- A pit or trench should be dug about two meters deep. It should be half filled with waste, and then covered with lime within 50 cm of the surface, before filling the rest of the pit with soil.
- It must be ensured that animals do not have any access to burial sites. Covers of galvanized iron or wire meshes may be used.
- On each occasion, when wastes are added to the pit, a layer of 10 cm of soil shall be added to cover the wastes.
- Burial must be performed under close and dedicated supervision.
- The deep burial site should be relatively impermeable and no shallow well should be close to the site.
- The pits should be distant from habitation, and located so as to ensure that no contamination occurs to surface water or ground water. The area should not be prone to flooding or erosion.
- The location of the deep burial site shall be authorized by the prescribed authority i.e CPCB/ SPCB or District Pollution Control Board Office.
- The institution shall maintain a record of all pits used for deep burial.
- The ground water table level should be a minimum of six meters below the lower level of deep burial pit

COMMON BIOMEDICAL WASTE TREATMENT FACILITIES (CBWTF)

Common Biomedical Waste Treatment facilities (CBWTF) are facilities established to collect, treat and dispose biomedical waste from healthcare facilities. The facilities operate incinerator, autoclave and shredders etc. to treat different types of biomedical wastes. These provide safe and economical options for treatment and disposal of wastes. Approximately twenty such facilities are currently registered with UP Pollution Control Board in the state of Uttar Pradesh. Each facility is required to provide services for an area of 150 km around the facility as per CPCB guidelines.

Their specific roles and responsibilities include:

- Take all necessary steps to ensure that the bio-medical waste collected from the occupier is transported, handled, stored, treated and disposed of, without any adverse effect to the human health and the environment, in accordance with these rules and guidelines issued by the Central Government or, as the case may be, the central pollution control board from time to time.
- Ensure timely collection of bio-medical waste from the occupier as prescribed under these rules.
- Establish a Bar- Code System for bags or containers containing bio-medical waste to be sent out of the premises or for the further treatment and disposal in accordance with the guidelines issued by the Central Pollution Control Board by 27th March, 2019.
- Inform the prescribed authority immediately regarding the occupiers which are not handing over the segregated bio-medical waste in accordance with these rules.
- Provide training for all its workers involved in handling of bio-medical waste at the time of induction and at least once a year thereafter.
- Assist the occupier in training conducted by them for bio-medical waste management.
- Undertake appropriate medical examination at the time of induction and at least once in a year and immunize all its workers involved in handling of bio-medical waste for protection against diseases, including Hepatitis B

and Tetanus, that are likely to be transmitted while handling bio-medical waste and maintain the records for the same.

- Ensure occupational safety of all its workers involved in handling of bio-medical waste by providing appropriate and adequate personal protective equipment.
 - Report major accidents including accidents caused by fire hazards, blasts during handling of bio-medical waste and the remedial action taken and the records relevant thereto, (including nil report) in Form I to the prescribed authority and also along with the annual report.
 - Maintain a log book for each of its treatment equipment according to weight of batch; categories of waste treated; time, date and duration of treatment cycle and total hours of operation.
 - Allow occupier, who are giving waste for treatment to the operator, to see whether the treatment is carried out as per the rules.
 - Shall display details of authorization, treatment, and annual report etc on its web-site.
 - After ensuring treatment by autoclaving or microwaving followed by mutilation or shredding, whichever is applicable, the recyclables from the treated bio-medical wastes such as plastics and glass, shall be given to recyclers having valid consent or authorization or registration from the respective State Pollution Control Board or Pollution Control Committee.
 - Supply non-chlorinated plastic coloured bags to the occupier on chargeable basis, if required.
- Common bio-medical waste treatment facility shall ensure collection of biomedical waste on holidays also.
- Maintain all record for operation of incineration, hydroor autoclaving for a period of five years; and
 - Upgrade existing incinerators to achieve the standards for retention time in secondary chamber and Dioxin and Furans within two years from the date of this notification

B). MEASURES FOR WASTE MINIMIZATION:

1. As far as possible, purchase of reusable items made of glass and metals should be encouraged.
2. Select Non PVC Plastic items.
3. Adopt procedures and policies for proper management of waste generated to reduce the quantity of waste to be treated.
4. Establish effective and sound recycling policy for plastic recycling and get in touch with authorized manufactures.