

## A REVIEW ON BIO-MEDICAL WASTE MANAGEMENT

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### *Abstract*

*The issue of biomedical waste management has assumed great significance in recent times. Government of India has made proper handling and disposal of this category of waste a statutory requirement with the publication of gazette notification no 460 dated 27 July 1998. The provisions are equally applicable to our service hospitals and hence there is a need for the entire service medical, dental, nursing officers other paramedical staff and safaiwal as to be well aware of the basic principles of handling, treatment and disposal of biomedical waste. The present article deals with such basic issues as definition, categories and principles of handling and disposal of biomedical waste.*

**Keywords:** Bio-medical waste, Hospital infections, Hospital waste disposal

### INTRODUCTION

The subject of biomedical waste management and handling has been assuming increasing significance for the past few years. The responsibility of medical administrators as regards proper handling and disposal of this category of waste has now become a statutory requirement with the promulgation of Government of India (Min of Environment and Forests) gazette notification no. 460 dated 27 Jul 1998. The provisions of the gazette are also applicable to Armed Forces hospitals. The present system of biomedical waste disposal system in Armed Forces is far from satisfactory. It is therefore highly desirable that all service officers concerned with the administration of hospitals and other health care echelons take all steps to adhere to the laid down directives. It is equally important that all service medical, dental, nursing officers, other paramedical staff and waste handlers such as safaiwalas be well oriented to the basic requirements of handling and management of biomedical waste. It is with this objective of providing such basic information that the present article has been composed.

### DEFINITION

Biomedical waste is defined as any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals, or in research activities pertaining thereto, or in the production or testing of biological.

### CATEGORIES OF BIOMEDICAL WASTE

There are ten defined categories as follows.

1. Human anatomical waste: (tissues, organs, body parts)
2. Animal waste: (including animals used in research and waste originating from veterinary hospitals and animal houses).
3. Microbiological and biotechnology waste: (including waste from lab cultures, stocks or specimens of microorganisms, live or attenuated vaccines, wastes from production of biological, etc.)
4. Waste sharps: (used/unused needles, syringes, lancets, scalpels, blades, glass etc.)

5. Discarded medicines and cytotoxic drugs.
6. Soiled wastes: (items contaminated with blood and body fluids, including cotton dressings, linen, plaster casts, bedding etc.)
7. Solid wastes: (wastes generated from disposable items other than waste sharps such as tubing, catheters, i.v. sets, etc.)
8. Liquid waste: (waste generated from washing, cleaning, housekeeping and disinfection activities including these activities in labs).
9. Incineration ash: (from incineration of any biomedical waste)
10. Chemical waste: (chemicals used in production of biological and disinfection).

The Central Pollution Control Board (CPCB) has designated separate colour-coded bins to dispose of biomedical wastes as per their nature.

1. **Yellow Bin:** For anatomical waste, chemical waste, soiled waste, chemotherapy waste, discarded linen and medicines, and laboratory waste.
2. **Red Bin:** For contaminated plastic wastes
3. **Blue Bin:** For glass waste and metallic implants
4. **Black Bin:** For hazardous and other waste

#### PRINCIPLES OF BIO-MEDICAL WASTE MANAGEMENT

The principles of biomedical waste management are as follows:-

- A. General principles of hygiene and sanitation.
- B. Observance of general principal of hygiene and sanitation such as cleanliness, good housekeeping and adequate supply of safe water, sanitary facilities and proper ventilation are essential components of a good bio-medical waste management plan.
- C. Waste minimization- It is essential that every waste generated from the hospital should be identified and quantified. Hospitals should endeavor to reduce waste by controlling inventory, wastage of consumable items and breakages etc. Waste can also be minimized by recycling certain waste such as glassware, plastic material etc after proper cleaning and disinfection.
- D. Waste segregation- Segregation of waste at source and safe storage is the key to whole hospital waste management process. Segregation of various types of wastes into different categories according to their treatment/disposal options should be done at the point of generation in color coded plastic bags/containers as per schedule II of the gazette notification. The needles and syringes should be disinfected and mutilated before segregation.
- E. Waste treatment on site- Microbiological and biotechnology waste being highly infectious should be treated on site by autoclaving/microwaving/chemical treatment. The guidelines for chemical disinfection of different categories of biomedical wastes.
- F. Waste transportation- The waste should be transported to kerb collection area in covered container. All containers should have biohazard label according to schedule III of the gazette notification. If a container is transported from the premises where biomedical waste is generated to any waste treatment facility outside the premises, the container shall, apart from the label prescribed in schedule III also carry information prescribed in schedule IV. The containers and the vehicles used for transportation of biomedical waste should not be used for any other purpose.

- G. Final disposal- The various disposal options after treatment are incineration, secured landfill, vermin composting and public sewers. Biomedical waste should be treated and disposed off finally in accordance with schedule 1 of the rules and the prescribed standards given in schedule V of Govt of India gazette notification by one of the following methods
- ✓ **Chemical treatment** – sharps, solid, liquid and chemical wastes
  - ✓ **Autoclaving/Microwaving** – microbiology/biotechnology, sharps, soiled and solid wastes.
  - ✓ **Incineration** – human, animal, microbiology/biotechnology and solid waste.
  - ✓ **Deep burial in secured landfills** – discarded medicines, incineration ash and chemical solid waste such as mercury.
  - ✓ **Drainage** – liquid waste, chemical liquid waste, cytotoxic waste in addition to being toxic is mutagenic hence should never be diluted and discharged into the sewers.

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