

## Biomedical Waste Management – A Review

**Dr. Vijay Ebenezer**

*Professor and Head of Department Oral and Maxillofacial surgery Sree balaji dental college and hospital Pallikaranai, Chennai – 100*

---

### ABSTRACT:

The activities that are usually performed as part of health care waste management involve segregation, storage, collection, transportation and disposal of biomedical waste. It includes organizational, planning, administrative, financial, engineering aspects, legal, and human resource development and their management involves interdisciplinary relationships. Management of biomedical waste requires commitment at all the levels from healthcare providers. A system that is managed by irresponsible and untrained staff, the risks and the importance of their “contribution” is dreaded. Awareness regarding rules of disposal of biomedical waste needs to be taught even among qualified

medical personnel, including hospital administrators, private and governmental institutes, hospitals and colleges. This article is to further the knowledge regarding biomedical waste management .

**KEYWORDS:** Biomedical waste , waste management , health workers , biowaste .

### INTRODUCTION:

Biomedical waste is any kind of waste containing infectious (or potentially infectious) materials <sup>1</sup>. It may also include waste associated with the generation of biomedical waste that visually appears to be of medical or laboratory origin (e.g., packaging, unused bandages, infusion kits, etc.), as well research laboratory waste containing biomolecules or organisms that are mainly restricted from environmental release <sup>2</sup>. As detailed below, discarded sharps are considered biomedical waste whether they are contaminated or not, due to the possibility of being contaminated with blood and their propensity to cause injury when not properly contained and disposed of <sup>3</sup>. Biomedical waste is a type of biowaste. The disposal and collection of these poses a great hazard to health practitioners , sanitation workers and the general public . It can cause AIDS , Hepatitis , tetanus etc . Therefore biomedical waste management is extremely important .

### DISCUSSION :

Classification of biomedical waste <sup>4</sup>:

Biomedical waste has been broadly classified into hazardous and non hazardous waste .

Non hazardous waste - The wastes generated by health care centres are basically nonhazardous wastes which comprise about 85% .it constitutes food remnants, paper cartons, packaging material, fruit peels, wash water etc.

Hazardous waste – It is further classified into potentially toxic and potentially contagious waste .

- 1) Potentially toxic waste – This includes radioactive wastes , chemical wastes and pharmaceutical wastes .
- 2) Potentially contagious waste – This includes dressings and swabs infected with blood , pus etc , lab wastes , potentially infected material , sharps , blood and blood products .

Steps for effective biomedical waste management :

The waste has to first be surveyed<sup>5</sup> . It is one of the most essential steps of biomedical waste management . It helps in making a clear distinction of the types of waste , to enumerate the wastes , the amount of wastes generated and the steps taken for disinfection in the hospital .

The next step is the segregation of waste . Segregation refers to the primary division of different categories of waste generated at basis and thereby dipping the risks as well as cost of handling and disposal<sup>6</sup>. Effective segregation only can ensure useful bio-medical waste management . The BMWs have to be segregated inharmony to guidelines laid down under schedule 1 of BMW Rules, 1998. This includes segregating wastes into different types of containers <sup>7,8</sup>.

| COLOUR CODING           | TYPE OF CONTAINER                    | WASTE CATEGORY  |
|-------------------------|--------------------------------------|---|
| Yellow                  | Plastic bag                          | Cat 1 , 2 ,3 , 6 ( human anatomical waste, animal waste, microbiology & biotechnology waste , solid waste ) |
| Red                     | Disinfected container / Plastic bag  | Cat 3,6,7 (microbiology & biotechnology waste ,solid waste )  |
| Blue/ white translucent | Plastic bag/puncture proof container | Cat 4,7 (waste sharps ,solid waste)   |
| Black                   | Plastic bag                          | Cat 5,9,10 ( discarded medicine and cytotoxic drugs, incineration ash,chemicals)                            |

Transportation of Bio-Medical wastes can be done by Carts and containers that are not used for any other function <sup>9</sup>. The trolleys have to be cleaned each day. Offsite carrying vehicle should be marked with the name and address of transporter. Biohazard sign should be dyed. No unprocessed biomedical waste store more than 48 hours<sup>10</sup>.

Treatment refers to the method that modifies the waste in some way before it is get to its ultimate resting place<sup>3</sup>. It is mainly necessary to disinfect or decontaminate the waste, right at source so that it is no longer the source of pathogenic organisms. After such treatment, the remains can be handled safely, transported and store up. Syringe nozzle and needles should be shredded in syringe cutters and needle destroyers. Broken glass /Scalpel blades/ Lancet/ should be keep in separate containers with bleach, transferred to plastic/ cardboard boxes; sealed to prevent spillage and transported to incubators. Glassware must be disinfected, sterilized and cleaned. Culture plates with possible culture must be autoclaved; media are placed in suitable bags and disposed off. The plates can be reused after

sterilization. Gloves should be cut / shredded / mutilated before disposal. Swabs should be chemically sterilized followed by incineration. If they have only a small quantity of blood that does not drip, they could be placed in the garbage. Disposable objects should be dipped in freshly prepared 1% sodium hypochlorite for 30 min to 1 hour, after that mutilation is required before disposal should be the policy adopted for such items. Heat should be used for disposal of amalgam, under no circumstances. It will cause mercury to volatilize and be discharged to the environment. So, teeth filled with amalgam should be treated by immersion in high-level disinfectants (e.g. Gluteraldehyde) for 30 min. Liquid waste produced by the laboratory is either pathological or chemical. Noninfectious waste should be defused with reagents. Liquid contaminated waste should be treated with a chemical decontaminator and then defused. Whereas regular solid and liquid waste requires no treatment before disposal, virtually all contagious waste should first be treated.

Plastic is now a severe environmental and health concern, basically because of its non Bio degradable nature<sup>10</sup>. The nature of plastic waste disposal is environmentally friendly, Long-term, land filling or recycling. All disposable plastic should be subjected to shredding before disposing off to vendor.

#### **CONCLUSION :**

Biomedical waste management is as essential as treatment planning . More awareness programs must be conducted to increase the knowledge regarding the same among health care professionals . Periodic monitoring of the health care waste management must be carried out.

#### **REFERENCES :**

1. Sunil Kumar VC, Manjunatha. M, Badami Vijetha, Pradeep P.R., Biomedical Waste Management: a review. *J Oral Health Comm Dent* 2012;6(3):141-144.
2. Hegde V, Kulkarni RD, Ajantha GS. Biomedical Waste Management. *Journal of Oral and Maxillofacial Pathology* 2007;11(1):5-9.
3. Biomedical Waste Management Rules, 1998; notified by the Government of India.
4. Biomedical waste management, pdf. [www.proudtobedentist.com](http://www.proudtobedentist.com).
5. Gordon JG, Rein Hardt PA, Denys GA Medical waste management. In: Mayhall CG (ed). *Hospital epidemiology and infection control*. 3rd edition. Lippincott Williams and Wilkins publication; 2004: 1773-85.
6. Manual for control of hospital associated infection: Standard operative procedures. National AIDS control organization: Delhi; 1999: 50-66.
7. Laboratory diagnosis, biosafety and quality control. National institute of communicable diseases and national AIDS control organization: Delhi; 26-4.
8. BiomedicalWasteManagement.html. <http://www.ndcnihf.org/html/Legislations/>
9. Bio-medical waste management self learning document for doctors, superintendents and administrators. Environment protection training and research institute Gachibowli, Hyderabad, Andhra Pradesh.
10. Park K. Hospital Waste Management. Park's Textbook of Preventive and Social Medicine. 20th edition. Jabalpur, India: M/s Banarasidas Bhanot Publishers; 2009: 694-9.

11. Seymour Block S. Disinfection, sterilization and preservation. 5th ed. Lippincott Williams and Wilkins publication;2001.
12. Anurag V. Tiwari And Prashant A. Kadu. Biomedical Waste Management Practices In India-A Review. International Journal Of Current Engineering And Technology 2013; 3(5).