

HOSPITAL BIOMEDICAL WASTE MANAGEMENT

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Abstract - Biomedical Waste Management in India brings together the various aspects of waste management, public health and environment as they relate to a developing country like India. As link between health and environmental quality is receiving its due attention, the commitment to safeguard the environment from both the physical and social impacts associated with Biomedical Waste is growing. On one hand the long term physical environmental impacts like contamination and pollution of groundwater and air have drawn attention of the geoscientists and on the other hand the ripples of mishandling Biomedical Waste on the social environment, in the form of the pivotal role of the rag pickers in the entire waste management process, has emerged as the an interesting study for social scientists. The aim of this paper is to highlight the present scenario of the various phases of biomedical waste management throughout the country and to integrate environmental parameters into the decision making process adopting holistic and sustainable strategies to address the crisis revolving around biomedical waste management.

Keywords - Biomedical, Biomedical Waste, Waste Management, Hospital Management, Hospital.

INTRODUCTION

Hospital is a place of almighty, a place to serve the patient. Since beginning, the hospitals are known for the treatment of sick persons but we are unaware about the adverse effects of the garbage and filth generated by them on human body and environment. Bio-medical waste is defined as waste that is generated during the diagnosis, body fluids (such as syringes, needles, ampoules, organs and body parts, placenta, dressings, disposables plastics and microbiological wastes). Hospital is one of the complex institutions which is frequented by people from every walk of life in the society without any distinction between age, sex, race and religion.

This is over and above the normal inhabitants of hospital i.e. patients and staff. All of them produce waste which is increasing in its amount and type due to advances in scientific knowledge and is creating its impact. The hospital waste, in

addition to the risk for patients and personnel who handle these wastes poses a threat to public health and environment. Keeping in view inappropriate bio medical waste management, the Ministry of Environment and Forests notified the "Biomedical Waste (management and handling) Rules, 1998" in July 1998. In accordance with these Rules (Rule 4), it is the duty of every "occupier" i.e. a person who has the control over the institution and or its premises, to take all steps to ensure that waste generated is handled without any adverse effect to human health and environment.

The hospitals, nursing homes, clinic, dispensary, animal house, pathological lab etc. are therefore required to set in place the biological waste treatment facilities. It is however not incumbent that every institution has to have its own waste treatment facility. The rules also envisage that common facility or any other facilities can be used for waste treatment. However It

		beddings, other material)
Cat no 7	Disinfections by chemical treatment autoclaving/micro waving & mutilation shredding.	Solid Waste (Items contaminated with blood and body fluids including cotton, dressings, soiled plaster casts, line beddings, other material
Cat no 8	Disinfections by chemical treatment discharge into drain	Solid Waste (Items contaminated with blood and body fluids including cotton, dressings, soiled plaster casts, line beddings, other material
Cat no 9	Disposal in municipal Landfill	Incineration Ash (ash from incineration of any bio-medical waste)

Color	Type of container	Waste category	Treatment option as per schedule 1
	Plastic bag Container/Plastic b Plastic bag/ punctual proof container Plastic bag		
Red	Disinfected		
Blue/ translucent white	Container/Plastic b		
black	plasti		

3. Transportation within hospital, waste routes must be designated to avoid the passage of waste through patient care areas. Separate time should be earmarked for transportation of bio-medical waste to reduce chances of it's mixing with general waste. Desiccated wheeled containers, trolleys or carts should be used to transport the waste/plastic bags to the site of storage treatment. Trolleys or carts should be thoroughly cleaned and disinfected in the event of any spillage. The wheeled containers should be so designed that the waste can be easily loaded, remains during transportation, does not have any sharp edges and is easy to clean and disinfect. Hazardous biomedical waste needing transport to a long distance should be kept in containers and should have proper labels. The transport is done through desiccated vehicles specially constructed for the purpose having fully enclosed body, lined internally with stainless steel or aluminum to provide

smooth and impervious surface which can be cleaned. The driver's compartment should be separated from the load compartment with a bulkhead. The load compartment should be provided with roof vents for ventilation.

4. Treatment of hospital waste Treatment of waste is required: to disinfect the waste so that it is no longer the source of infection. To reduce the volume of the waste make waste unrecognizable for aesthetic reasons make recycled items unusable.

4.1 *General waste*: 85% of the generated waste in the hospital belongs to this category. The safe disposal of this waste is the responsibilities of the local authority.

4.2 *Bio-medical waste*: 15% of hospital waste Deep burial: The waste under category 1 and 2 only can be accorded deep burial and only in cities having less than 5 lakh populations.

Autoclave and microwave treatment Standards for the autoclaving and microwaving are also mentioned in the Biomedical waste (Management and Handling) Rules 1998. All equipment installed/shared should meet these specifications. The waste under category 3,4,6,7 can be treated by these techniques. Standards for the autoclaving are also laid down. Shredding: The plastic (IV bottles, IV sets, syringes, catheters etc.), sharps (needles, blades, glass etc) should be shredded but only after chemical treatment/microwaving/autoclaving.

Needle destroyers can be used for disposal of needles directly without chemical treatment. Secured landfill: The incinerator ash, discarded medicines, cytotoxic substances and solid chemical waste should be treated by this option. Incineration: The incinerator should be installed and made operational as per specification under the BMW rules 1998 and a certificate may be taken from CPCB/State pollution Control Board and emission levels etc should be defined. In case of small hospitals, facilities can be shared. The waste under category 1, 2, 3, 5, 6 can be incinerated depending upon the local policies of the hospital and feasibility. The polythene bags made of chlorinated plastics should not be incinerated. It may be noted that there are options available for disposal of certain category of waste. The individual hospital can choose the best option depending upon the facilities available and its financial resources. However, it may be noted that depending upon the option chosen, correct color of the bag needs to be used.

5. Safety measures

5.1 All the generators of bio-medical waste should adopt universal precaution and appropriate safety measures while doing therapeutic and diagnostic

activities and also while handling the bio-medical waste.

5.2 It should be ensured that: drivers, collectors and other handlers are aware of the nature and risk of the waste. Written instructions, provided regarding the procedures to be adopted in the event of spillage/accidents. Protective gears provided and instructions regarding their use are given. Workers are protected by vaccination against tetanus and hepatitis B.

6. Training each and every hospital must have well planned awareness and training programme for all categories of personnel including administrators (medical, paramedical and administrative). All the medical professionals must be made aware of Bio-medical waste (Management and Handling) Rules 1998. To institute awards safe hospital waste management and universal precaution practices. Training should be conducted to all categories of staff in appropriate language/medium and in an acceptable manner.

7. Management and administration: Heads of each hospital will have to take authorization for generation of waste from appropriate authorities as notified by the concerned State/ U.T. Government, well in time and to get it renewed as per time schedule laid down in the rules. Each hospital should constitute a hospital waste management committee, chaired by the head of the institute and having wide representation from all major departments. This committee should be responsible for making Hospital specific action plan for hospital waste management and its supervision, monitoring and implementation. The annual reports, accident reports, as required under BMW rules should be submitted to the

concerned authorities as per BMW rules format.

8. Measures for waste minimization: As far as possible, purchase of reusable items made of glass and metal should be encouraged. Select non PVC plastic items. Adopt procedures and policies for proper Management of waste generated, the mainstay of which is segregation to reduce the quantity of waste to be treated. Establish effective and sound recycling policy for plastic recycling and get in touch with authorized manufactures.
 9. Coordination between hospital and outside agencies Municipal authority: As quite a large percentage of waste (in India upto 85%), generated in Indian hospitals, belongs to general category (non-toxic and non-hazardous), hospital should have constant interaction with municipal authorities so that this category of waste is regularly taken out of the hospital premises for land fill or other treatment. Co-ordination with Pollution Control Boards: Search for better methods technology, provision of facilities for testing, approval of certain models for hospital use in conformity with standards laid down. To search for cost effective and environmental friendly technology for treatment of biomedical and hazardous waste. Also, to search for suitable materials to be used as containers for bio-medical waste requiring incineration / autoclaving / microwaving. Development of non-PVC plastic as a substitute for plastic which is used in the manufacture of disposable items.
2. Hospitals having defunct/defective incinerators should be made to utilize central incineration facility as efforts of Govt. are towards reducing the number of incinerators in cities to prevent rise in air pollution.
 3. Small health care establishments in city which have still not registered with central facility should be encouraged to register thereby bringing down the operating cost of contractor and decrease the cost of incineration per kg.
 4. Govt. hospitals which at present are totally left on their own should be brought into net of rigorous checking as far as BMW management is concerned and a corpus grant can be allotted to them to improve their infrastructural requirements for which provision exists in Govt. of India Rules.
 5. Community is utilizing the services of hospitals and "Polluter Pays" principle; it needs to contribute in building infrastructure for BMW. mgt. This contribution can be in the form of assistance in sharing the cost of consumables and capital cost of BMW mgt by Municipality, State Govt, Public bodies and Voluntary bodies like Rotary Club etc.

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RECOMMENDATIONS

1. After analyzing the results of the study it was felt that there is an urgent need to standardize the infrastructural requirement so that hospital following

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