



## Research Article

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# **BIO-MEDICAL WASTE MANAGEMENT IN DIFFERENT HOSPITALS OF GUWAHATI AND ITS EFFECT ON ENVIRONMENT**

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### ABSTRACT

Biomedical waste may be defined as the waste which is produced during the diagnosis, research activities, treatment of patients, treatment of animals, production and testing of biological product and including articles as mentioned in schedule I of the Biomedical Waste (Management and handling) (second amendment) Rules 2000, as per Ministry of Environment and Forests notification. Proper treatment, handling, and disposal of biomedical wastes is essential for healthcare infection control program. There may be a high risk of infections in patients due to the poor management of biomedical waste which can lead to antibiotic resistance. It is not only the health of the patient, but also the health of persons who are associated with health care industry equally important. This article speaks about how the hospitals present in Guwahati treat their waste material and the effect of the waste in the environment

### INTRODUCTION

In today's date biomedical waste has become an important concern for environment along with the hospitals. Various factors included in the generation of bio-medical waste includes waste management methods; type, occupancy & specialisation of healthcare units; ratio of items to be reused, infrastructure and resources available etc [1].

Biomedical waste may be of various types. It may be solid or liquid. Examples of biomedical waste include discarded blood, expired medicine, unwanted microbiological cultures, body part which is removed by operation, dressings, bandages, human tissue, animal tissue, discarded gloves, sharps like needles, broken glass and other medical supplies that contacted with blood, body fluids or laboratory waste.

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Other waste includes scalpels, lancets and other sharp devices which can penetrate skin. Proper management of biomedical waste has become a global concern as the negligence in proper disposal of biomedical waste has led serious threat to the environment and human health, especially the health care workers [2]. It has become a crash project to study the problems associated with disposal of biomedical waste from hospitals and health care institutions [3].

### **MATERIALS & METHODS**

#### **Preparation of list of different hospitals in Guwahati**

A list of hospitals present in Guwahati was prepared. From the list, number of hospitals was selected for the survey work. All the hospitals that were selected had a minimum of 20bedsd to 200 bedded. Major and minor operations are done in these hospitals on a daily basis. All the hospitals were having in-patient and out-patient departments.

#### **Preparation of questionnaires**

A list of questionnaires were prepared for the assessment of waste management system of hospitals by following the Bio-medical waste management and handling rules and guideline as per government of India Ministry of Environment, Forest and Climate Change, Published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (i) [4].

The prepared questionnaires are-

1. Are you aware of Biomedical Waste Management Rule?
2. Does your hospital follow Biomedical waste management rule?
3. Have you been instructed to take care of biomedical waste in your ward?
4. Are your biomedical waste disposal activities monitored by your immediate higher authority?
5. How have you learned on biomedical waste management?
6. Is the importance of the biomedical waste management discussed in departmentmeeting ?
7. Did your hospital have an infection control committee?
8. Tick the facilities available for biomedical waste treatment and disposal in your hospital.
9. Do you think that biomedical waste has to be disposed in colour coded bags?
10. Is the infectious waste labelled with the Bio-Hazard symbol? Has your institution does a biomedical waste audit in regulatory?

11. Does the hospital maintain a register for biomedical waste disposal?
12. Does the hospital weigh the biomedical waste generated in the ward?
13. Whether the waste bags are sent with mouth open?
14. Do you ware mask and gloves during waste collection?
15. Do you have washed hands after collecting or during the discard of waste?
16. Do you have any needle stick injury during the handling of biomedical waste?
17. In red bin which type of waste are kept?
18. In blue bin which type of waste are kept?
19. In yellow bin which type of waste are kept?
20. In black bin which type of waste are kept?

#### **Hospital visit and took permission**

Before conduction the project work the official permission was taken from the respective hospital authorities with due permission of the organization. The work has been carried out following the rules and regulation and guidelines as implemented and maintained by hospital authorities

#### **Personnel interviewed**

After taking the permission from the higher authority, we took an interview to the hospitals staff (housekeeping staff, like nurse etc.) and asked questions about the waste management system of the hospital and collect the data.

#### **Visit to the ‘fresh air’ waste management services Pvt. Ltd**

Visit to the fresh air waste management services Pvt. Ltd.to know how they destroy or manage the waste without harming the environment.

#### **Study the effect of waste management on the environment**

Study the different harmful effect on the environment by the process of waste management.

#### **Data analysis**

All the data collected from different hospitals of Guwahati was analyzed and a report was prepared with graphical representation.

### **RESULTS & DISCUSSIONS**

On our project work entitled “Biomedical waste management of different hospitals in Guwahati”, after performing surveys of

13 hospitals in Guwahati we found that almost 90% of the hospitals present in Guwahati are having a satisfactory waste management system and disposal policy to maintain good environment. According to the data all the hospitals are aware and following BMW rule. Existence of the infection control committee is about 77% and 23% of the hospitals are not having any infection control committee. All the hospitals are using biohazard symbols with proper segregation of waste. BMW audit is found almost 70%. Among all the hospitals 93% are having the maintenance record and use of mask and gloves during handling of waste is 100%. Around 30% needle stick injury is found during discarding of waste.

Based on the survey, it was found that most of the hospitals store and segregate the biomedical wastage without using incinerator. Autoclave is done only by 46% of hospitals. As there is only segregation process and storage is done in most of the hospitals so there is a chance of causing infection from the waste if they are not properly stored or if the waste is kept for a longer period

**Table 1: Analysis of data collected from different hospitals of Guwahati**

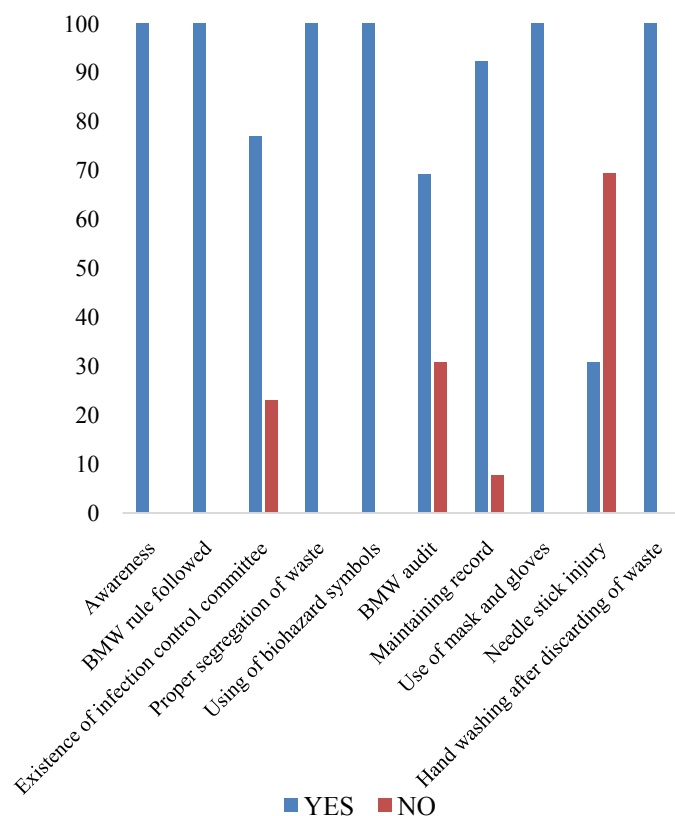
DATA	YES	NO
Awareness of BMW rule	100%	-
BMW rule followed	100%	-
Existence of infection control committee	76.9%	23.1
Proper segregation of waste	100%	-
Using of biohazard symbols	100%	-
BMW audit	69.2%	30.8%
Maintenance of record	92.3%	7.6%
Uses of mask and gloves	100%	-
Needle stick injury	30.7%	69.3%
Hand washing after discarding of water	100%	-

**Effect on environment**

Mostly, the medical wastes are incinerated emitting toxic air pollutants & ash residues. This in turn gives rise to high level of dioxins in the environment. The toxic ash residues sent to landfills for disposal used to percolate to groundwater and thereby resulting in polluting it.

Dioxins, being a major toxic chemical which may cause cancer, birth defects, diabetes, immune system disorders and disrupted sexual development. Hepatitis B, hepatitis C and human

immunodeficiency virus are most commonly found infections that are transmitted to the health care workers.



**CONCLUSION**

After doing this work and going through all the studies we concluded that there are various laws, standards, rules and regulations prescribed for medical waste management i.e. for segregation of medical waste, handling of medical waste, holding of waste in a hospital compound, disposal of waste and the treatment technologies for different type of medical wastes. But there is still a lack of compliance of medical waste management rules and regulations in the practical field.

As the segregation of waste at the time of generation is not done properly or efficiently this leads to the risk of infections to the patients as well as for the other people and staff in the hospital premises and environment also. The waste disposal bins are sometimes kept near to the waiting areas in the hospital due to which there is a high risk to the people who visited in the hospital or worked in the hospital of getting infected from diseases.

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***CONFLICT OF INTEREST***

The authors declare no conflict of interest

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