# PRACTICES OF BIOMEDICAL WASTE MANAGEMENT AT A MULTI SPECIALITY HOSPITAL

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**Abstract**

Hospital waste management is part of hospital hygiene and a prerequisite for good medical waste management. Hospitals and health-care establishments have a "duty of care" for the environment, for public health, and have particular responsibilities in relation to the waste they produce. The onus is on such establishments to ensure that there are no adverse health and environmental consequences of their waste handling, treatment, and disposal activities.[1] Even after the implementation of bio-medical wastes rules (management and handling) in July 1998, the condition remains more or less unchanged. It can be attributed to lack of knowledge, resources and enforcement of the regulations.[2,3] The data was collected from various departments like Operation Theater, Accident and Emergency Department, Labour Room, Medical and Surgical Wards and House Keeping Department of multi speciality hospital. The data was collected from all the paramedical staff in the form of an interview with the help of structured questionnaire and one month observation. The results were as follows O.T 81%, Labour room 84%, Emergency 87%, Medical Surgical Ward -81%, Housekeeping 81%. These results show the Percentage of departmental efficiency in doing segregation and disposal of Biomedical wastes. There is less awareness among the paramedical staff with regard to handling of biomedical waste. All the departments are not following any disinfection treatment for liquid wastes, the reason might be the non provision of facility by the hospital. As the infected waste may harm the public, the hospital must give due consideration to disinfect the liquid waste before disposing through the drainage.



**Key words:** Bio-medical waste; Segregation, disposal, treatment, Hygiene.

## Introduction

Health care waste is a special category of waste, which needs to be handled appropriately with precautions because it carries a higher potential for infection and injury than any other type of waste. Currently it is being managed casually.[4]

It is estimated that patients in India generate biomedical waste between 0.5 to 1kg of waste/person/day. In Karnataka State (SOER – 2003), the generation of health care waste has been estimated to be 1.0Kg/bed/day in private and government health care establishments, 1.5kg/day in blood bank, 1.0kg/day in diagnostic laboratory, 0.2kg/day in small clinics and 0.25kg/day in veterinary clinics. As the healthcare industry over the last decade has shifted from a reusable product supply system (eg: glass syringes, hospital laundry etc.,) to a primarily disposable product supply system (eg: disposable syringes and needles, disposable hospital linen etc.,) which has caused an increase in the health care waste generation and managing the same has become a problem.[2,3,4]

Majority of the problem can be avoided if the health care waste management is properly

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managed. The activities that are commonly done in the health care waste management are segregation, storage, collection, transportation and disposal of health care waste. It encompasses, organizational planning, administrative, financial, legal, engineering aspects, human resource development and their management involves inter-disciplinary relationships. [5]

**Medico legal aspects of hospital waste management**

National legislation is the basis for improving health-care waste practices in any country. It establishes legal controls and permits the national agency responsible for the disposal of health-care waste, usually the ministry of health, to insist for their implementation.

A national law on health-care waste management may stand alone or may be part of more comprehensive legislation such as the following:

1. Law on management of hazardous wastes: application to health-care waste should be explicitly stated;
2. Law on hospital hygiene and infection control: a specific chapter or article should be devoted to health-care waste.

Indiscriminate disposal of infected and hazardous waste from hospitals, nursing homes and pathological laboratories has led to significant degradation of the environment, leading to spread of diseases and putting the public to great risk from certain highly contagious and transmission prone disease vectors. This has given rise to considerable environmental concern.

The first standard on the subject to be brought out in India was by the Bureau of Indian Standards (BIS), IS 12625 : 1989, entitled 'Solid Wastes- Hospitals-Guidelines for Management' (Annexure 7.1) but it was unable to bring any improvement in the situation. In this scenario, the notification of the 'Biomedical waste (Management & Handling) Rules, 1998' assumes great significance.[1]

The notification served by the Ministry of Environment and Forests, Govt, of India 011'27th- July, 1998 called as Bio-medical Waste (Management and Handling) Rules. These rules have been made by the Central Government, in exercise of the powers conferred by sections 6, 8 and 25 of the Environment (Protection) Act 1986

Any violation to these rules are punishable by 5 years rigorous imprisonment or a fine or rupees five thousand.

Bio-medical Wastes are to be handled only according to these rules. Few important are

**Rule 6 pertains to:** Setting up of biomedical waste facility

**Rule 12 emphasizes:** Responsibility of generators and operators of bio-medical waste facility.

**Rule 13 deals with:** Segregation, packaging, transportation and storage.

**Rule 14 deals with:** Treatment and disposal

**Rule 15 declares the necessity of:** Maintenance of Records.

These records, as the rule notifies, shall be subject to inspection and verification by the appropriate authority from time to time.[6]

**Materials and methods**

The research approach adopted in the study is descriptive method. It includes collection of information, opinion and attitude directly from the subjects of the study through interview with structured questionnaire. The descriptive method of investigation attempts to describe and interpret, what exists at present in the organization as a method, rules and regulations. The study was conducted from April 2011 – May 2011.The tool was given to forensic and community experts for content validity. Based on their suggestions restructuring of tool was done. Statistical analysis: Tests of central tendency are used.

**Results**

The obtained Percentage of departmental

efficiency in doing segregation and disposal of Biomedical wastes from O.T - 81%, Labour room - 84%, Emergency - 87%, Medical Surgical Ward - 81% and Housekeeping - 81%.

The interviewed data is sorted out into numerical data and is enlisted as seen in tables in Annexure I. Here, the obtained data is compared with the standards. In this study for simplicity in analysis, Zero (O) represents 'No' that is, they are not following the standards and 'one' (1) represents 'Yes' that is, they are following the standard.

Analysis through all the tables showed that many of the departments are keeping the process of biomedical waste management right up to the mark as far as possible with their limited resources.

Few drawbacks are, as in Table 1 they are not able to follow separate provision for storage of waste and disinfection of liquid wastes as per standard. Table 2 reveals that much concentration should be given to the area of separate storage provision for keeping the wastes. From the question number the investigation feels that the respondents are biased or the procedures are not properly under stood by all the employees of the department. Table 3 reveals that answer to the question number 4 is negatively answered by one of the respondents, even though they are keeping it as per the standard. The respondent may not be aware about the labeling system and hence the awareness among the staff should be confirmed.

Housekeeping department is extending a better work to increase the efficiency of the hospital. But still the hospital is not providing any separate staircase / corridor for the transportation of Bio medical wastes. Eye shields are not provided for staff protection.

From many departments, a general view is that, hospital authorities were providing less care regarding separate storage area for wastes and disinfection method for liquid wastes. In all the departments the respondents are aware about the nosocomial infection due to improper biomedical waste management.

**Discussion**

The ministry of environment & forests notified the biomedical waste (management & handling) Rules, 1998" (BMW Mgt) in July 1998. In accordance with these rules, "every hospital generating BMW needs to set up requisite BMW treatment facilities on site or ensure requisite treatment of waste at common treatment facility." Handling segregation, mutilation, disinfection, storage, transportation and final disposal are vital steps for safe and scientific management of biomedical waste in any establishment.[7]

Anatomical waste, sharp waste, solid waste, soiled waste and liquid waste are the different types of wastes that are produced in these departments. Disposal of these wastes are being done in accordance to the guidelines. As the hospital is providing proper training to the staff, they are well aware about the nosocomial infection due to improper biomedical waste management. The awareness of nurses and their due action reduces the incident of nosocomial infection.

The data collected from housekeeping department proves that the hospital is providing basic measures to protect themselves while working. The department is following the guidelines for the disposal of the bio-medical wastes.

According to Madhuri Sharma, segregation of BMW should be done at the source of generation of biomedical waste itself. The biomedical waste should be segregated as per categories applicable and colour coding in accordance with the B.M.W. (Management & Handling) Rules 1998.' The investigator feels that, in this hospital all the studied departments are doing proper segregation.[8]

As per Biomedical waste (Management and Handling) Rules 1998 the "human anatomical waste should be treated and disposed by incineration / deep burial, waste sharps by disinfection / shredding, soiled waste by incineration or autoclaving solid waste should be

disinfected by chemical treatment / shredding and liquid waste by chemical treatment and discharge into drains.[9] In this hospital all the departments dispose the anatomical, sharp soiled and solid wastes as per the law. But they are not following any disinfection method for liquid wastes. From this we can understand that the reason might be the non provision of facility by the hospital. As the infected waste may harm the public, the hospital must give due consideration to disinfect the liquid waste, before disposing through the drainage. More over it is advisable for the hospital, to provide eye shield to health care waste management workers even though they provide all the necessary protective measures to them.

**Recommendations**

Health-care waste management, as well as posing technical problems, is strongly influenced by cultural, social, and economic circumstances. A well designed waste policy, a legislative framework, and plans for achieving local implementation are essential. Change will be gradual and should be technically and financially sustainable in the long term.

**Conclusion**

The present study has revealed that the practice of health care waste management is inadequate and rudimentary. There is a need to improve the awareness levels as well as practice of health care waste management appropriately for which necessary training and follow up are required.

All the departments are not following any disinfection treatment for liquid wastes. As all the departments are not doing, we can understand that the reason might be the non provision of facility by the hospital. As the infected waste may harm the public, the hospital must give due consideration to disinfect the liquid waste before disposing through the drainage.

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**TABLE 1 Comparison between standard and hospital data from OT**

| Q. No. | STANDARD | RESPONSES | | | | |
|---|---|---|---|---|---|---|
| | | I | II | III | IV | V |
| 2 | Colour coding method for proper segregation | 1 | 1 | 1 | 1 | 1 |
| 4 | Labeling on the Bins | 1 | 0 | 1 | 1 | 1 |
| 6 | Separate provision for storage of waste. | 1 | 1 | 1 | 1 | 1 |
| 7 | Close Lidded container for collection of waste | 1 | 1 | 1 | 1 | 1 |
| 8 | Anatomical wastes should be treated/ disposed by incineration/deep burial. | 1 | 1 | 1 | 1 | 1 |
| 9 | Sharp wastes should be treated /disposed by shredding or burning | 1 | 1 | 1 | 1 | 1 |
| 10 | Sharp wastes should be disinfected before disposing. | 1 | 1 | 1 | 1 | 1 |
| 11 | Soiled wastes should be disposed by incineration | 1 | 1 | 1 | 1 | 1 |
| 12 | Solid wastes are treated / disposed off by disinfection by chemical treatment / Shredding | 1 | 1 | 1 | 1 | 1 |
| 13 | Liquid wastes should be | | | | | |
| 14 | disinfected before discarding. | 0 | 0 | 0 | 0 | 0 |
| 15 | Incinerator should be present | 1 | 1 | 1 | 1 | 1 |
| | Total | 10/11 | 9/11 | 10/11 | 10/11 | 10/11 |

**TABLE 2 Comparison between standard and hospital data from labour room**

| Q. No. | STANDARD | RESPONSES | | | | |
|---|---|---|---|---|---|---|
| | | I | II | III | IV | V |
| 2 | Colour coding method for proper segregation | 1 | 1 | 1 | 1 | 1 |
| 4 | Labeling on the Bins | 1 | 0 | 1 | 1 | 1 |
| 6 | Separate provision for storage of waste. | 1 | 1 | 1 | 1 | 1 |
| 7 | Close Lidded container for collection of waste | 1 | 1 | 1 | 1 | 1 |
| 8 | Anatomical wastes should be treated/ disposed by incineration/ deep burial. | 1 | 1 | 1 | 1 | 1 |
| 9 | Sharp wastes should be treated/ disposed by shredding or burning | 1 | 1 | 1 | 1 | 1 |
| 10 | Sharp wastes should be disinfected before disposing. | 1 | 1 | 1 | 1 | 1 |
| 11 | Soiled wastes should be disposed by incineration | 1 | 1 | 1 | 1 | 1 |
| 12 | Solid wastes are treated / disposed off by disinfection by chemical treatment / Shredding | 1 | 1 | 1 | 1 | 1 |
| 13 | Liquid wastes should be | | | | | |
| 14 | disinfected before discarding. | 0 | 0 | 0 | 0 | 0 |
| 15 | Incinerator should be present | 1 | 1 | 1 | 1 | 1 |
| 11 | Total | 10/11 | 9/11 | 10/11 | 10/11 | 10/ |

**TABLE 3 Comparison between standard & hospital data from emergency department**

| Q. No. | STANDARD | RESPONSES | | | | |
|---|---|---|---|---|---|---|
| | | I | II | III | IV | V |
| 2 | Colour coding method for proper segregation | 1 | 1 | 1 | 1 | 1 |
| 4 | Labeling on the Bins | 1 | 0 | 1 | 1 | 1 |
| 6 | Separate provision for storage of waste. | 1 | 1 | 1 | 1 | 1 |
| 7 | Close Lidded container for collection of waste | 1 | 1 | 1 | 1 | 1 |
| 8 | Anatomical wastes should be treated/ disposed by incineration/deep burial. | 1 | 1 | 1 | 1 | 1 |
| 9 | Sharp wastes should be treated /disposed by shredding or burning | 1 | 1 | 1 | 1 | 1 |
| 10 | Sharp wastes should be disinfected before disposing. | 1 | 1 | 1 | 1 | 1 |
| 11 | Soiled wastes should be disposed by incineration | 1 | 1 | 1 | 1 | 1 |
| 12 | Solid wastes are treated / disposed off by disinfection by chemical treatment / Shredding | 1 | 1 | 1 | 1 | 1 |
| 13 | Liquid wastes should be | | | | | |
| 14 | disinfected before discarding. | 0 | 0 | 0 | 0 | 0 |
| 15 | Incinerator should be present | 1 | 1 | 1 | 1 | 1 |
| | Total | 10/11 | 9/11 | 10/11 | 10/11 | 10/11 |