

## Survey of Biomedical Waste Management and Practice in Thyrocare Pvt.Ltd

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### ABSTRACT.

Biomedical waste is any waste produced during the diagnosis, treatment, immunization of human or animal research activities pertaining thereto or in the production or testing of biological or in health camps. It follows the cradle to give approach which is characterization, quantification, segregation, storage, transport and treatment of biomedical waste. The basic principle of good biomedical waste practice is based on the concept of 3Rs, namely, reduce, recycle, and reuse. The best biomedical waste management methods aim at avoiding generation of waste or recovering as much as waste as possible rather than disposing. Biomedical waste treatment and disposal facility means any facility where in treatment; disposal biomedical waste or processes incidental to such treatment and disposal is carried out. Only about 10%-25% of biomedical waste is hazardous, and the remaining 75% to 95% is nonhazardous. The hazardous part of the waste presents physical, chemical, and microbiological risk to the general population and health care workers associated with handling, treatment, and disposal of waste.

### INTRODUCTION

In a World health organization meeting in Geneva in June 2007, core principle for achieving safe and sustainable management of health care waste were developed. It was stressed that through right investment of resource and complete commitment, the harmful effect of health care waste to the people and environment can be reduced. All stake holders associated with financing and supporting health –care activities are morally and legally obliged to ensure the safety of other and there for should share in the cost of proper management of biomedical waste. In addition it is the duty of manufacturer to produced environment-friendly medical device to ensure its safe disposal. World health organization reinforced that gravamen should designate a part of the budget for creation, support, and maintenance of efficient health care waste management system. These include Nobel and ingenious method / devices to reduce the bulk and toxicity of health care waste .non- governmental organization should undertake and program and activities that contribute in this incentive. The first edition of WHO hand book on safe management of

waste health care activates known as “the blue book” came out in 1999. The second edition of “the blue book” published in 2014 has newer method for safe disposal of biomedical waste, new environment pollution control measure, and detection technique.

The hospital waste, in addition of the risk for patient and personnel who handle these waste poses health and environment. Keeping in view inappropriate biomedical waste, 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. person who has the control over the institution and 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, clinics, dispensaries, animal houses, pathological labs etc., therefore required to set in place the biological waste treatment facilities. The biomedical waste 1998 rule were modified in the following years-2000, 2003, and 2011. The draft of biomedical waste Rules 2011 remained as draft and did not get notified because of lack of consensus on categorization and standard. Now the ministry of environment, forest and climate change in March 2016 have amended the biomedical waste management rules. These new rules have increased the coverage, transportation and disposal method to decrease environmental pollution. It has four schedules, five forms and eighteen rules.

### **The approach of the nation toward biomedical waste handling during the COVID-19 pandemic.**

The pandemic scenario added to an unexpectedly high biomedical waste amount from the hospital, testing laboratories, and quarantine centers. The calculation of the exact amount of biomedical waste is challenging. A study has suggested the increment in biomedical waste generation to be as high as six fold in comparison to the pre-pandemic situation. The increment in the volume and quantity places a high demand for additional resources and training. There is an urgent requirement for additional personal protective equipment and workers to manage biomedical waste safely. A lack of sufficient data and accurate information on biomedical waste during COVID-19 exaggerates the problem further. The unexpected rise in biomedical waste during the pandemic has raised fear among biomedical waste handlers [13, 14, 15], because the virus created an uncertain work environment and increased the occupational risk of exposure, leading to occupational stress. New materials have been added to the biomedical waste generated during the pandemic, especially from the quarantine centers. Hence, the ministry's existing guidelines will need to be updated. To overcome this panic situation, the central pollution control board and the India Institute of Medical Sciences, New Delhi, framed new guidelines for the safe handling and disposal of biomedical waste. The state and central pollution control board suggested strict adherence to all the guidelines laid previously in biomedical waste rules 2016 and adopted additional precautionary measures. Biomedical waste rudimentary disposal and the lack of a proper system heightened the risk of hospital-acquired infection and several

other environment hazards. The likelihood of health hazard has seen an increase by many folds during the pandemic due to the high infectivity of the virus. Additional precautionary measures and amendments to lessen the probable transmission of COVID -19 via biomedical waste are explained below.

Measures required in the healthcare facilities for safe handling and disposal of biomedical waste- Handling of solid biomedical waste-

1. The guideline recommends the use of color-coded bins for onsite segregation and the usage of double -layered bags in the COVID -19 isolation areas.
2. There should be additional and temporary bins for disposable PPEs; gloves and masks and separate containers for reusable materials (e.g. 95 mask for cleaning and sterilization.
3. The feces from the confirmed COVID -19 positive patient should be collected a diaper and segregated as the category BMW or it can be collected in a pan flushed in the toilet following which the toilet should be disinfected in adherence to the SOPs.
4. There be separates segregation bags and carrier trolleys for handling the biomedical waste generated at COVID -19 areas. The Bags and containers should be well labeled as “COVID 19 for easy identification, treatment, and disposal biomedical waste. The outer and inner surface of the containers and trolleys be cleaned by using a 1-2% sodium hypochlorite solution.
5. A separate record should be maintained for biomedical waste generated from COVID 19 related Activities and the should be reported to the pollution control board.
6. The facilities can download the official application of the central pollution control board COVID 19 Bio medical waste management from the google play store and register in the app in order to Upload the details ease.
7. A separate arrangement for the transportation of biomedical waste from the hospital to the Common biomedical waste disposal and treatment facility should be made.
8. There should be dedicated vehicles for the transportation of biomedical waste and it should be Sanitized after every trip.

Managing the liquid waste and wastewater from hospital and laboratories .....

1. All the healthcare facilities operating STP and the terminal sewage plant operators are responsible for treating the liquid waste.

2. The hospital and the person involving in its handling should ensure the inactivation or death of coronavirus.
3. All the STP should strictly follow the SOPs framed by pollution control board.
4. The worker involved in the handling wastewater treatment should be protected with PPE.
5. The utilization of treated water from the STP can be avoided during the pandemic.

## **MATERIAL AND METHODS**

**PLACE OF STUDY:** - This study was conducted in different sections of Laboratory including Biochemistry, Hematology, LCMS, Clia, iCPMS etc. Thyrocare Pvt. Ltd., Gurugram, India.

**STUDY DESIGN:** - This study is a descriptive, observational and Lab based study. The study was conducted between February 2023 to April 2023. Study of Area were-

### **1. Hematology**

#### **STUDY TOOL**

**Data were recorded on researcher made checklist covering various aspects of biomedical waste management at sources of generation of waste.**

**Primarily, 4 broad functions are carried out sources viz.**

- (i) Placement of 4 color – coded i.e. black, yellow, red and blue waste bin which are lined on inner side by similarly colored waste bags.
- (ii) Segregation of waste such as bags i.e. general waste like waste paper, wrapper of drugs, cardboard, left over food etc. Is to be put in to black, solid infected waste like dressing material, cotton swab etc. Is to be put in yellow, plastic waste like plastic syringes, dextrose bottle, indigenous sets, recycle tubes, urinary catheters etc. Is to be put in to red and sharps like hypodermic needles, surgical blades, glass etc. Is to be put in blue bags.

(iii) Mutation of recyclable waste like disposable, syringe, plastic dextrose bottle, plastic tubing and hypodermic needles.

(IV) Disinfection of certain categories of waste notably plastic and sharp. In the hospital, electrically operated needle cutters were used to mutilate hypodermic needle and nozzle (HUB) of disposal syringes and scissors were used to cut the plastic tubing and 1% bleaching powder was used to disinfect plastic and sharps parameters related to each of the 4 main categories mentioned above were identified and checklist was prepared.

### **BIO MEDICAL WASTE CHECKLIST**

An observational checklist was used for the purpose of study. A composite observational checklist based on biomedical waste management standards are prescribed by National Accreditation Board for Hospital (NABL), Ministry of Health and Family Welfare, Government of India was used for biomedical waste. Based on a point prevalence study, a checklist was framed having ten sections, which covers different aspects of the audit. Each section contains listed with Statement.....

The Section included in the checklist are:-

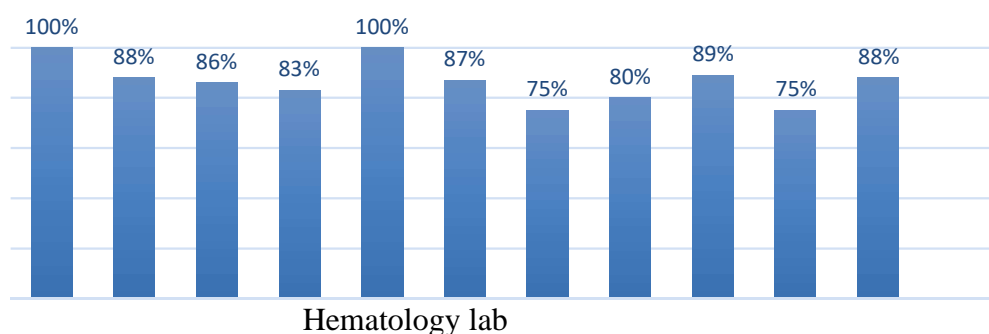
<b>Section 1</b>	<b>Basic Requirements for Biomedical Waste</b>
<b>Section 2</b>	<b>Man power of BMW</b>
<b>Section 3</b>	<b>Tanning for BMW</b>
<b>Section 4</b>	<b>Generation and segregation</b>
<b>Section 5</b>	<b>Collection and storage</b>
<b>Section 6</b>	<b>Transport in hospital</b>
<b>Section 7</b>	<b>Common Collection Facility</b>
<b>Section 8</b>	<b>Transport from hospital</b>
<b>Section 9</b>	<b>Treatment and disposal</b>

	FEBRUARY				MARCH				APRIL				%
1.Dustbin as per color code	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100%
2.Waste bag as per color code	Yes	NO	Yes	NO	Yes	Yes	NO	Yes	NO	Yes	Yes	NO	88%
3.mixed segregation	Yes	Yes	NO	Yes	NO	Yes	NO	Yes	Yes	Yes	Yes	NO	86%
4. B.M.Wsignage	Yes	Yes	Yes	NO	Yes	Yes	Yes	NO	Yes	Yes	Yes	Yes	83%
5.Biohazard singon dustbin &bags	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	100%
6.Sharp container	Yes	NO	Yes	NO	Yes	NO	Yes	NO	Yes	NO	Yes	NO	87%
7.Fluid hypo chloride	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NO	Yes	NO	Yes	Yes	75%
8.Tained staff	Yes	Yes	NO	NO	Yes	NO	Yes	NO	Yes	NO	Yes	NO	80%
9.TransportTrolley	Yes	Yes	NO	Yes	Yes	NO	Yes	NO	Yes	NO	Yes	Yes	89%
10.Dress	Yes	NO	NO	NO	Yes	NO	Yes	NO	Yes	NO	Yes	NO	75%
11.As for separate colorbags	Yes	Yes	Yes	NO	Yes	NO	Yes	NO	Yes	NO	Yes	NO	88%

Hematology lab

## RESULT

There are three month survey done in Thyrocare Pvt. Ltd., gurugram, Haryana, which are given below month wise. Each area was visited on any three non-consecutive days in the study period. No visit was made on Sunday on public holiday. Area were visited during morning hours between 7 am to 10 am and evening hours of the same days between 2 pm and 4 pm



## CONCLUSION

In our present study, an attempt was made to do the survey analysis study of the biomedical waste in Thyrocare Pvt. Ltd., Gurugram, Haryana. The current practice of poor biomedical waste management poses a huge threat to the community. There is risk of transmission of various communicable diseases such as gastro-intestinal infections, respiratory tract infections, skin diseases due to various modes of transmission such as injuries from sharps. Enterococcus species, Staphylococcus aureus, Escherichia coli, Klebsiella species, Pseudomonas species, Acinetobacter species, Clostridium tetani, HIV, Hepatitis A, Hepatitis B are some of the most common microorganisms responsible for infections. According to checklist of Government of India, it was observed that the basic requirements for medical waste were deficient in the area of OT/LABORATORY/OPD/EMERGENCY/LABORATORY/ICU/NICU WARD & CAMPUS (7.15%). In our present study reported that awareness among worker before intervention was (32.76%) related to training of BMW, as (75%) of them had as core and improved post implementation of training program. In our present study reported that the BMW condition of generation and segregations We have observed that the (83.33%) was segregated at the site of generation, The BMW condition was Continuously improved post after intervention. In our present study reported that awareness among workers



before intervention was unsatisfactory(50%) related to methods of collection and storage. In our present study of transportation section reports suggest that conditions are well functioning upto 60% which indicates that continuous service in transportation needs to be improved. In our study of treatment and disposal section after reports suggests that 72.42% conditions are well functioning, some improvement may be needed in disinfection before disposal, and mixing of infectious and non-infectious waste. In our study of management of different waste stream reports suggest that 53.84% of conditions are well functioning which indicates that improvement is needed in proper management of waste disposal. In our study of common collection facility resulted in 100% well functioning condition. The assessment of scores of different areas showed that score related to condition of waste containers and segregation of waste was not significantly different among various areas such as OTs ,casualty, various

Wards and ICUs. The score related to 'mutilation of recyclable waste' was found to be considerably different between OTs and casualty . The score in OTs(93%)was significantly higher than casualty Segregation of waste is the most essential step for proper management of BMW as waste segregated into various color-coded containers is eventually taken to different sites for disposal. Presence of an incorrect kind of waste in a particular container will apparently nullify the efforts of appropriate disposal of waste.This implies that for proper segregation of waste,the waste bins in appropriate number, at appropriate places and with appropriate color-code are necessary to be consigne that the source of generation of waste.

A similar study, the mean percentage score of condition of waste containers in all the patient care areas in this study was more than 80%. Several studies have found poor condition of waste containers for waste disposal. In a study conducted in South India, there were only white bins for all types of Bio-medical waste for visual reasons making segregation practices difficult.

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