

The logo of Galgotias University is a circular emblem with a stylized 'G' shape in the center. The 'G' is composed of several curved segments in shades of yellow, orange, and blue. The background of the emblem is a light, multi-colored swirl.

Biomedical Waste (Management & Handling) Rules

**GALGOTIAS
UNIVERSITY**

School of Basic & Applied Sciences

Course Code : MEV302

Course Name: Waste Management



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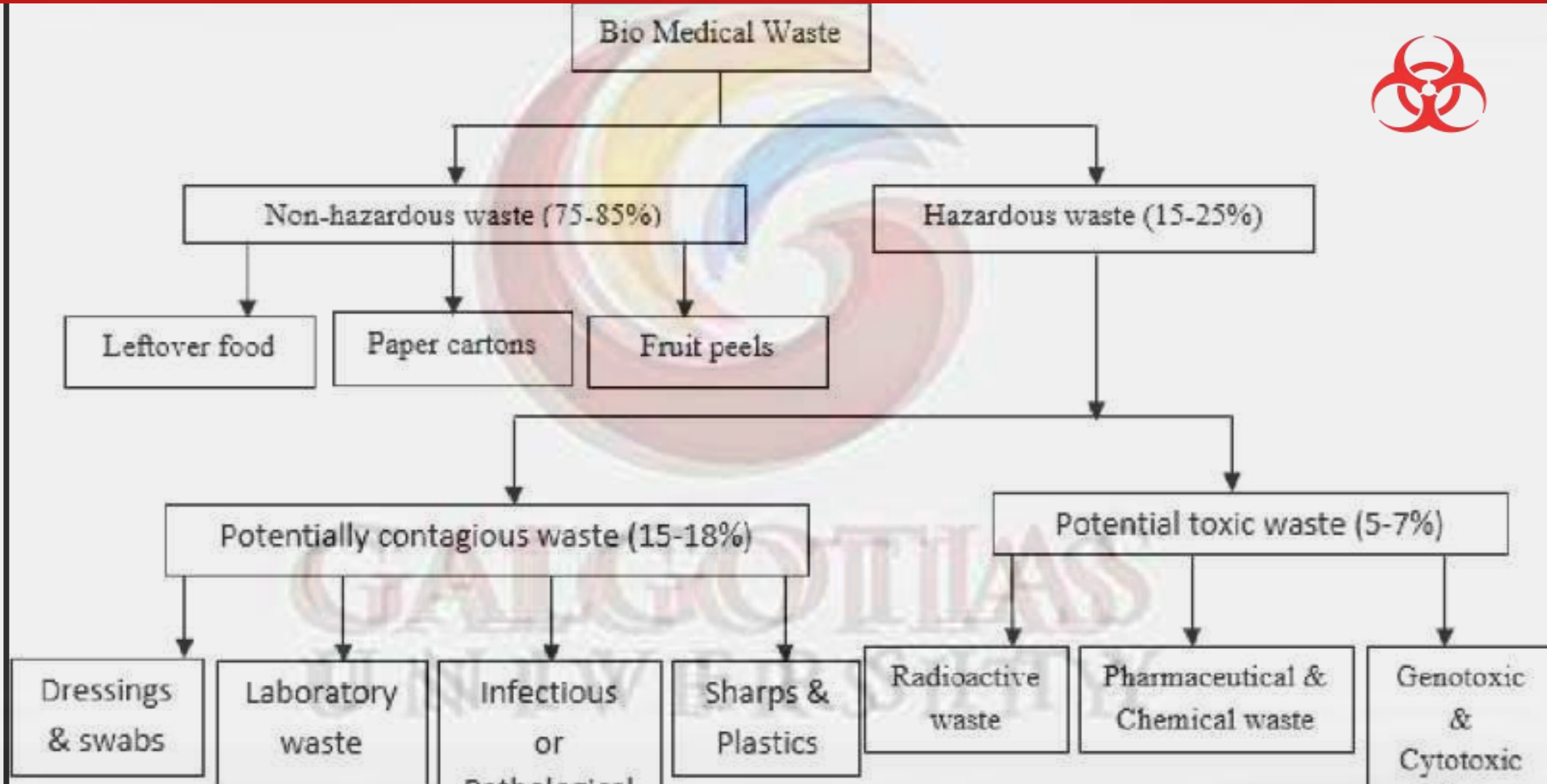
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INTRODUCTION

- ❑ **Biomedical waste-** any waste, which is generated during the diagnosis, treatment and immunization of human beings or animals or in research activities pertaining to thereto or in production or testing of biologicals.
- ❑ **Sources-** Hospitals, Health clinic, Nursing homes, Medical research laboratories, veterinarians and Funeral homes, etc.
- ❑ These wastes **include** human and animal anatomical wastes, waste sharps, biotechnological wastes, discarded medicines and chemical wastes. (it may be solid or liquid in nature)
- ❑ In India, the **generation rate** is:-
 - ❑ 1-2 kg per bed per day in a hospital.
 - 0.6 kg per bed per day in a clinic.





WHY IS THERE A NEED FOR MANAGEMENT

- These wastes cause air, water as well as land **pollution**.
- Risk of **infections** outside the hospitals for waste handlers and scavengers dwelling on them.
- Poor handling** of these wastes which includes sharps can cause injuries.
- These can be **radioactive** in nature causing Headache, Dizziness, DNA damage, Carcinogenesis and other serious issues.
- Drugs needs to be disposed-off due to their **infectious** nature.
- Risk associated with handling of **hazardous chemical** wastes from hospitals.



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Mis-management Scenario



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STEPS IN MANAGEMENT



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Biomedical Waste (Management & Handling) Rules, 1998



- ❑ **Drafting**- The Govt. of India as contemplated under **section 6,8 & 25** of the Environment Protection Act, 1986 made the Biomedical Wastes (management and handling) Rules, 1998.
- ❑ **Applications**-
 - The rules are applicable to **every institutions** generating biomedical waste including hospitals, nursing homes, laboratories, etc. The rules are applicable to **all persons** who generate, collect, receive, store, transport, treat, dispose or handle biomedical wastes in any form.
- ❑ **Duty**- It is the duty of every **occupier** generating biomedical waste, to take all steps to ensure that such wastes are handled without any adverse impact on health and environment.
- ❑ **14 Rules, 6 Schedules and 5 Forms** were formulated.

SCHEDULES FORMULATED

- SCHEDULE I-** **Categorizes** the biomedical wastes into 10 groups namely human anatomical, animal, microbiology & biotechnology, sharps, medicines and drugs, soiled, solid, liquid, incineration ash and chemical wastes.
- SCHEDULE II-** **Color coding** and type of container for disposal of biomedical wastes which are yellow, red, blue/white translucent and black.
- SCHEDULE III-** It **labels** biomedical waste **container/bag** with bio-hazard or cytotoxic hazard.
- SCHEDULE IV-** It prescribes the **label for transport** of biomedical waste container/bag.
- SCHEDULE V-** It formulates the standard for **treatment and disposal** of biomedical wastes.
- SCHEDULE VI-** A schedule for **waste management** facilities like incinerator/autoclave/microwave system.

Extent of the problems faced by India (April 2011 survey)

- >95,000** hospitals and healthcare facilities in India .
- 4.2 lakh kg** of biomedical waste is generated on a daily basis.
- 3 million tonnes** of medical wastes generated every year.
- Expected to **grow 8% annually**.

- 2,91,983 kg/day BMW is disposed which means that almost **28% of the wastes is left untreated** and not disposed finding its way in dumps or water bodies and re-enters our system.
- Karnataka tops** the generation chart with 62,241 kg/day of BMW.
- Only **179 CTF** to treat the BMW in the country.

Biomedical Waste (Management & Handling) Rules, 2011



- ❑ **Drafting**- The MoEF has notified the new draft Biomedical Waste (Management and Handling) Rules, 2011 under the **Environment Protection Act, 1986** to replace the earlier rules (1998) and the amendments thereof.
- ❑ **Applications**- It is applicable to **all the people** who generate, collect, receive, store, transport, treat, dispose or handle biomedical wastes in any form.
- ❑ **Duties**-
 - **Occupier**: responsible for handling, should train the handler and immunize them, segregation at the time of generation, practice occupational safety of all and proper management of day-to-day activities.
 - **Operator**: responsible for transport, handling, storage, treatment and proper disposal, ensure timely collection, conduct training program, ensure immunization of all, provide for occupational safety and should develop a proper management system.
- ❑ **17 Rules, 6 Schedules and 6 Forms** were formulated.

SCHEDULES FORMULATED (MODIFIED)

- ❑ **SCHEDULE I- Re-categorization** of Biomedical Waste was done corresponding to its treatment and disposal option, compacted to group under 8 categories where soiled and liquid waste along with incineration ash (1998) were replaced with infectious solid wastes.
- ❑ **SCHEDULE II- Color coding** (yellow, red, blue & black) and type of container/bag for disposal of Biomedical Wastes were done corresponding to its treatment option.
- ❑ **SCHEDULE III-** It **labels** biomedical waste **container/bag** with bio-hazard or cytotoxic hazard.
- ❑ **SCHEDULE IV- Label for transport** of Biomedical Waste container/bag (remains the same).
- ❑ **SCHEDULE V-** It sets the SCHEDULE I standards for **treatment and disposal** of Biomedical Waste.
- ❑ **SCHEDULE VI-** Enlists various **authorities and their duties**.

Comparisons of 2011 VS 1998 rules

2011

1998

Every occupier generating BMW, **irrespective of the quantity**, comes under this rule and requires to obtain authorisation.

Duties of the operator **listed**.

Treatment and disposal of BMW made mandatory **for all** the HCE's.

A format for **annual report** appended with the rules.

Form VI i.e., the report of the operator on HCE's not handing over the BMW added to the rules.

Occupier with **more than 1000 beds** required to obtain authorisation.

Operator **duties absent**.

Rules restricted to HCE's with **more than 1000 beds**.

No format for **annual report**.

Form VI is **absent**.

Extent of the problems faced by India (Early 2016 survey)

1,68,869 hospitals and healthcare facilities in India .

1.2 kg/bed of biomedical waste is generated on a daily basis.

484 tonnes of medical wastes generated every day.

Expected to **grow around 10% annually**.

447ton/day BMW is disposed which means that almost **38 ton/day of the wastes is untreated** and not disposed finding its way in dumps or water bodies and re-enters our system.

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Biomedical Waste Management Rules, 2016

- ❑ **Drafting**- The Ministry of Environment has notified the new draft **Biomedical Waste Management Rules, 2016** under the Environment Protection Act, 1986 to replace the earlier rules (1998) and the amendments thereof.
- ❑ **Applicability**- The **scope** of the rules have been **expanded** to include various health camps such as vaccination camps, blood donation camps, and surgical camps.
- ❑ **Duties**-
 - **Occupier**: responsibility of methodological sterilization & treatment/disposal, providing training to HCW's, separation of liquid waste, reporting of incidents and maintain disposal record.
 - **Operator**: In addition of earlier duties, they should assist in training of HCW's, establish barcoding system and maintain disposal record of 5 years.
- ❑ **18 Rules, 4 Schedules and 5 Forms** formulated.

Comparisons of 2011 VS 1998 rules

2011

1998

Every occupier generating BMW, **irrespective of the quantity**, comes under this rule and requires to obtain authorisation.

Duties of the operator **listed**.

Treatment and disposal of BMW made mandatory **for all** the HCE's.

A format for **annual report** appended with the rules.

Form VI i.e., the report of the operator on HCE's not handing over the BMW added to the rules.

Occupier with **more than 1000 beds** required to obtain authorisation.

Operator **duties absent**.

Rules restricted to HCE's with **more than 1000 beds**.

No format for **annual report**.

Form VI is **absent**.

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Schedule I	Categories of waste	Color code and type of waste with treatment and disposal
Schedule II	Color/code type of waste, waste category, treatment option	Standard for treatment of disposal of BMW (Autoclaving/ Microwaving/deep burial/dry heat sterilization/chemical disinfection)
Schedule III	Label of BMW category/bags	List of prescribed authorities and their duties
Schedule IV	Label for transport of BMW	Part A - label for container/bag Part B - label for transport of BMW bag/container
Schedule V	Standard for treatment and disposal of BMW	Added to schedule II
Schedule VI	List of prescribed authorities and their duties	Added to schedule III

BMW = Biomedical waste

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Comparisons of Forms in 1998 VS 2016

1998	2016
Form 1: Application for authorisation	Form 1: Accident reporting
Form 2: Annual report	Form 2: Application for authorisation or renewal of authorisation
Form 3: Accident reporting	Form 3: Authorisation (for operating facility) for BMW management
Form 4: Authorisation (for operating facility)	Form 4: Annual report
Form 5: Application for filing appeal against the order passed by the prescribed authority	Form 5: Application for filing appeal against the order passed by the prescribed authority

BMW: Biomedical waste

Classification of Storage Bins

Chemical waste goes in 'Black' bins

Plastic such as syringes and IV packs in 'Red' bins

Anatomical waste goes in 'Yellow' bins

Surgical tools and needles in

WASTE SEGREGATION

Segregation of Solid Bio-Medical Waste



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Comparisons of 1998 vs 2016 rules

1998

2016

Occupier with **more** than 1000 beds required to obtain authorisation.

Every occupier generating BMW including healthcamp, requires to obtain authorisation.

Operator **duties absent**.

Duties of operators listed.

Divided into 10 categories.

Divided into 4 categories.

Rules restricted to HCE's with **more than 1000 Beds**.

Treatment & disposal of BMW made mandatory for all HCE's.

No format of annual report.

A format of annual report appended with the rules.

Guidelines practiced during COVID'19 situation

- A challenge in non-major cities where hospitals are over-crowded and are difficult for carrying out BMW rules.
- It provides the series of steps for safe disposal of waste generated in hospital isolation wards for COVID- 19 patients, testing centres and laboratories, quarantine centres and homes of suspected patients.
- For isolation wards, additional precautions, double-layered bags are stressed apart from existing rules.
- Collection and storage of BMW separately try to handing over to CBTWF, it also fought that bags/containers used for collecting BMW from COVID 19 wards should be labelled as COVID-19 waste to enable identification.
- Similar steps for sample collection centres and laboratories for COVID-19 patients were specified by CPCB.
- For disposing of these wastes by CBWTF's, the CPCB asked them to maintain a separate record for collection, treatment and disposal of COVID-19 waste.

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COVID-19 Biomedical Wastes



General Biomedical Wastes

...and the saying goes, Let the Waste of the "Sick" not contaminate the lives of "The Healthy".

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