

MODULE 01

Introduction to Bio-Medical Waste

The presentation will focus on:

- i) History and definition of BMW as per the rules
- ii) Types of BMW as per the BMWM Rules, 2016

This session will familiarise the participants with a brief history of the biomedical waste origin, legal definition and types of BMW generated at healthcare facilities.

1.1 History: The beginning

The issue of bio-medical waste first came to prominence after medical waste started to wash up on several East Coast beaches in the USA. Concerns over the potential health hazards prompted the US Congress to enact the Medical Waste Tracking Act (MWTa) of 1988, which amended the Solid Waste Disposal Act.

In India, for long, medical waste was considered to be a part of municipal solid waste. When the environmental and health hazards associated with the mixing of these two waste streams were recognised, the Ministry of Environment and Forest (MoEF) came out with Draft Rules on biomedical waste in 1995. The drawback of these Rules was that there was too much dependence on incineration. All hospitals having 30 or more beds were asked to install on-site incinerators. The High Court ordered the implementation of these Rules in Delhi in 1996 in *Dr B.L. Wadhwa vs Union of India* case. Srishti, a non-governmental organisation (NGO), intervened with a Public Interest Litigation (PIL) in the Supreme Court, in which it asked to review the harmful impact of this order and the court was also requested to include alternative technologies, along with its operational standards. This resulted in the second drafting of the Rules, notified in 1997. The final Rules were notified on July 20, 1998 and were called Biomedical Waste (Management and Handling) Rules, 1998. Since then, the rules have undergone several amendments from time to time to improve compliance and strengthen the implementation of environmentally sound management of biomedical waste in India.

The new draft rules, named Biomedical Waste Management Rules 2015, were put in place in 2015. These rules have been notified vide Gazette Notification, no. G.S.R. 343 (E) dated March 28, 2016 and are called the Biomedical Waste management Rules, 2016.

1.2 Definition of BMW as per rule

The BMW Management Rules, 2016 defines bio-medical waste as any waste that is generated during the diagnosis, treatment or immunisation of human beings or animals, during research activities pertaining thereto, and in the production or testing of biological tissue or in health camps, including the categories mentioned in Schedule I appended to the 2016 Rules.



1.3 Classification of Bio-medical waste

Type of waste mentioned in Schedule I

Bio-medical waste is a type of hazardous waste that poses a significant risk to human health and the environment. In India, the Bio-Medical Waste Management Rules 2016 were enacted to regulate the handling, treatment, and disposal of such waste. This waste consists of the materials which have been in contact with the patient's blood, secretions, infected parts, biological liquids such as chemicals, medical supplies, medicines, lab discharge, sharps metallic and glassware, plastics etc. The quantity of such waste is around 10% to 15%¹ of total waste generated from the Health Care Facility. As per Schedule I of the rules, following is the categorisation:

Table 1: Types Bio-medical waste

Category	Type of Waste
YELLOW	Human Anatomical Waste Human tissues, organs, body parts and foetus below the viability period (as per the Medical Termination of Pregnancy Act 1971, amended from time to time).
	Animal Anatomical Waste Experimental animal carcasses, body parts, organs and tissues, including the waste generated from animals used in experiments or testing in veterinary hospitals or colleges or animal houses.
	Soiled Waste Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs and bags containing residual or discarded blood and blood components.
	Discarded or Expired Medicine Pharmaceutical waste like antibiotics and cytotoxic drugs including all items contaminated with cytotoxic drugs, along with glass or plastic ampoules, vials etc.
	Chemical Waste Chemicals used in the production of biological and used or discarded disinfectants
	Chemical Liquid Waste Liquid waste generated due to the use of chemicals in the production of biological and used or discarded disinfectants, Silver X - ray film developing liquid, discarded Formalin, infected secretions, aspirated body fluids, liquid from laboratories and floor washings, cleaning, house - keeping and disinfecting activities etc.
	Discarded linen, mattresses, beddings contaminated with blood or body fluid, routine mask & gown.
RED	Microbiology, biotechnology and other clinical laboratory waste (pre-treated) Microbiology, biotechnology and other clinical laboratory waste: blood bags, laboratory cultures, stocks or specimens of microorganisms, live or attenuated vaccines, human and animal cell cultures used in research, industrial laboratories, production of biological, residual toxins, dishes and devices used for cultures.
	Wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes without needles, fixed needle syringes with their needles cut, vacutainers and gloves
WHITE	Waste Sharps including metals needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades, or any other contaminated sharp object that may cause puncture and cuts. This includes both used, discarded and contaminated metal sharps
BLUE	Broken or discarded and contaminated glass, including medicine vials and ampoules except those contaminated with cytotoxic wastes.

¹ Guidelines for Management of Healthcare Waste as per Biomedical Waste Management Rules, 2016 prepared by CPCB and Ministry of health and family welfare

In addition to bio-medical waste, there are two other types of healthcare waste that require proper disposal. The first is general waste, which includes all non-biomedical waste that has not come into contact with any hazardous or infectious materials, and does not include sharps. The second type is other waste, which includes electronic waste, batteries, and radioactive waste which must be disposed of according to specific rules and guidelines. Proper disposal of all types of healthcare waste is crucial to protect public health and the environment.

1.4 General Waste

The general waste consists of all waste other than bio-medical waste and which has not been in contact with any hazardous or infectious, chemical or biological secretions and does not include any waste sharps. This waste consists of mainly:

- (i) Newspaper, paper and card boxes (dry waste)
- (ii) Plastic water bottles (dry waste)
- (iii) Aluminium cans of soft drinks (dry waste)
- (iv) Packaging materials (dry waste)
- (v) Food containers after emptying residual food (dry waste)
- (vi) Organic/Bio-degradable waste - mostly food waste (wet waste)
- (vii) Construction and Demolition wastes

These general wastes are further classified as dry wastes and wet wastes and should be collected separately.

This quantity of such waste is around 85 % to 90 %² of the total waste generated from facilities. Such waste is required to be handled as per the Solid Waste Management Rules, 2016 and Construction & Demolition Waste Management Rules, 2016, as applicable.

1.5 Other Wastes

Other wastes consist of used electronic wastes, used batteries, and radio-active wastes which are not covered under biomedical wastes but have to be disposed of as and when such wastes are generated as per the provisions laid down under E-Waste (Management) Rules, 2016, Batteries (Management & Handling) Rules, 2001, and Rules/guidelines under Atomic Energy Act, 1962 respectively.

² Guidelines for Management of Healthcare Waste as per Biomedical Waste Management Rules, 2016 prepared by CPCB and Ministry of health and family welfare