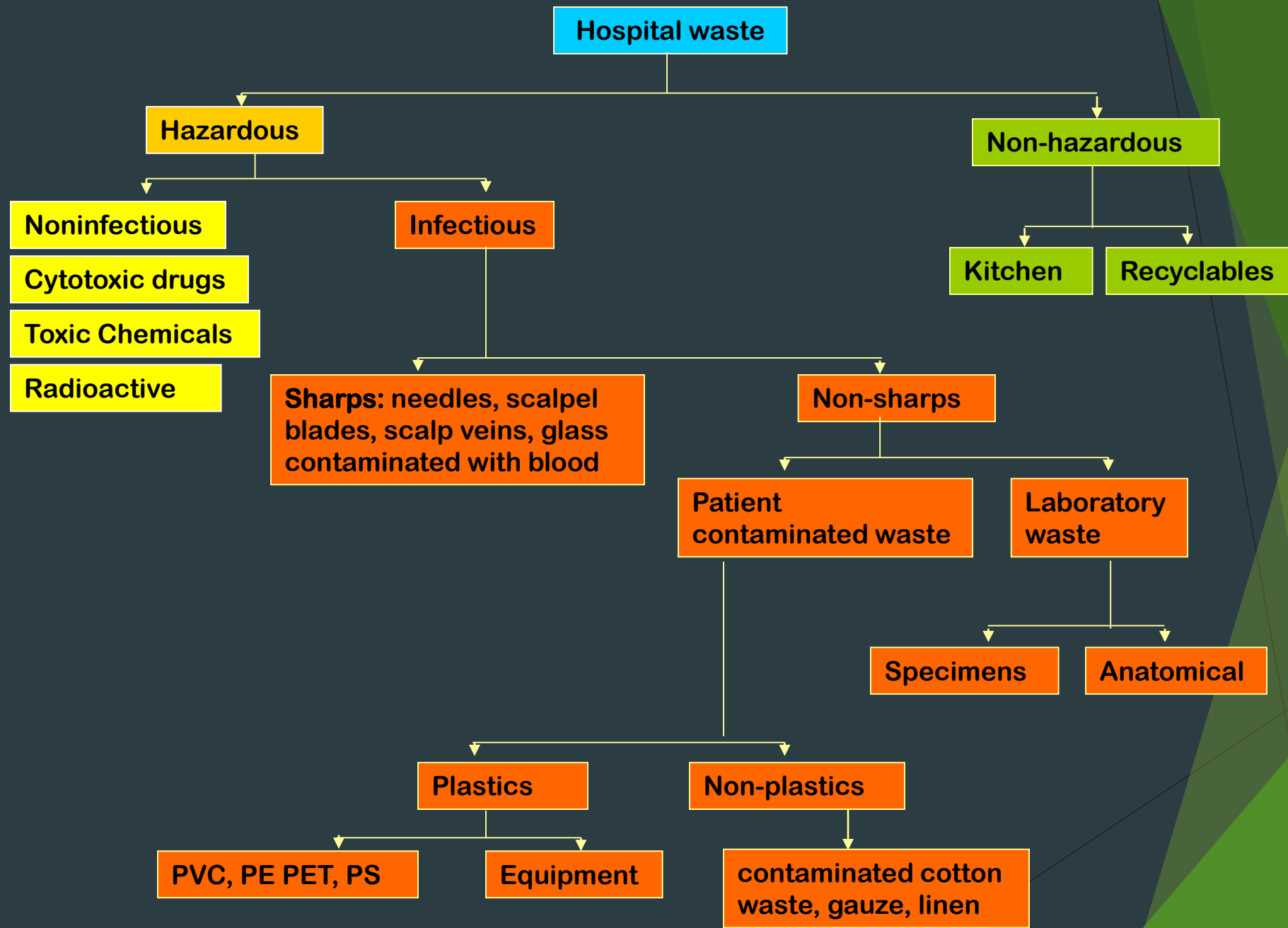


# WASTE MANAGEMENT SYSTEM

DR SANJAY BISWAS  
PROF. & HEAD,  
DEPT. OF MICROBIOLOGY, TMC



[Published in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section (i)]

**GOVERNMENT OF INDIA**  
**MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE**

**NOTIFICATION**

**New Delhi, the 28<sup>th</sup> March, 2016**

**G.S.R. 343(E).**-Whereas the Bio-Medical Waste (Management and Handling) Rules, 1998 was published *vide* notification number S.O. 630 (E) dated the 20<sup>th</sup> July, 1998, by the Government of India in the erstwhile Ministry of Environment and Forests, provided a regulatory frame work for management of bio-medical waste generated in the country;

In exercise of the powers conferred by section 6, 8 and 25 of the **Environment (Protection) Act, 1986** (29 of 1986), and in supersession of the Bio-Medical Waste (Management and Handling) Rules, 1998, the Central Government hereby makes the following rules, namely:-

**‘Bio-Medical Waste Management Rules, 2016’**

# CONTENTS OF BMW RULES 2016 DOCUMENT



- Application
- Definitions
- Duties of the Occupier
- Duties of the Operator
- Duties of authorities
- Treatment and disposal
- Segregation, packaging, transportation and storage
- Prescribed authority
- Procedure for authorisation
- Advisory committee
- Monitoring of implementation of rules in health care facilities

- Annual report
- Maintenance of Records
- Accident reporting
- Appeal
- Site for common biomedical waste treatment and disposal facility
- Liability of the occupier, operator of a facility
- 
-

# CONTENTS OF BMW RULES 2016 DOCUMENT



## ➤ SCHEDULES

- ❖ I : BMW categories and their segregation, collection, treatment, processing and disposal options
- ❖ II: Standards for treatment and disposal of BMW
- ❖ III: List and duties of prescribed authorities
- ❖ IV: Labels for BMW containers/bags and transportation

## ➤ FORMS

- ❖ I: Accident reporting
- ❖ II: Application for authorisation or renewal of authorisation
- ❖ III: Authorisation
- ❖ IV: Annual report
- ❖ V: Application for appeal

## RULES ARE NOT APPLICABLE TO:



- ❖ Radioactive waste
- ❖ Hazardous chemicals
- ❖ Municipal solid waste
- ❖ Lead acid batteries
- ❖ Hazardous waste
- ❖ Hazardous microorganisms

## ❖ DEFINITION OF BIOMEDICAL WASTE (BMW)

Any waste generated during

- Diagnosis
- Treatment
- Immunisation
- Research activities
- **Health camps**



## DUTIES OF THE OCCUPIER (US)



Sr. no	Duty	Description
1.	Storage area	Safe, ventilated, secured location BMW to be transported directly to CBMWTF
2.	Pre-treat laboratory waste, microbiological waste, blood samples and blood bags	On-site disinfection/ sterilisation as prescribed by <b>WHO or NACO</b> Do not mix treated BMW with municipal solid waste
3.	<b>Phase out use of chlorinated plastic</b> bags, gloves and blood bags	Within two years



## DUTIES OF THE OCCUPIER (US)



Sr. no	Duty	Description
4.	<b>Compulsory training</b> of all healthcare workers (HCW's) with evidence	<ul style="list-style-type: none"><li>- At time of induction</li><li>- At least once yearly</li><li>- Details of training programme to be reflected in annual report</li></ul>
5.	<b>Immunisation</b> of all HCW's	Against Hepatitis B and Tetanus
6.	<b>Bar-code and global positioning system</b> for bags or containers containing BMW to be sent out of premises	Within one year of notification


# DUTIES OF THE OCCUPIER (US)



Sr. no	Duty	Description
7.	Liquid chemical waste <ul style="list-style-type: none"><li>- Chemicals in production of biologicals</li><li>- Used or discarded disinfectants</li><li>- X-ray film developers</li><li>- Formalin</li><li>- Infected secretions/ body fluids</li><li>- House keeping liquids</li></ul>	<ul style="list-style-type: none"><li>- Segregation at source</li><li>- <b>Pre-treat or neutralise prior to mixing with other effluents</b></li></ul>
8.	Liquid waste	Treatment and disposal in accordance with Water (Prevention and control of Pollution) Act, 1974

# SCHEDULE I

## BMW Categories and their segregation, collection, treatment, processing and disposal options


Category	Type of waste	Type of Bag/ Container	Treatment and Disposal options
<b>Yellow</b> 	(a) Human anatomical waste - Human tissues - Organs, body parts - Fetus below viability period (as per MTP Act 1971)	Yellow coloured non-chlorinated plastic bags	Incineration or Plasma Pyrolysis or deep burial

## Dead fetus disposal

- ❖ Below the viability period (as per the MTP Act 1971) can be considered as human anatomical waste
- ❖ To be handed over to operator of CBMWTF in yellow bag
- ❖ Attach Copy of the **official MTP certificate** from the Obstetrician or the Medical Superintendent of hospital or healthcare establishment


# SCHEDULE I

## BMW Categories and their segregation, collection, treatment, processing and disposal options

Category	Type of waste
<b>Yellow</b> 	(b) Animal anatomical waste <ul style="list-style-type: none"><li>- Experimental animal carcasses</li><li>- Organs, body parts, tissues</li></ul>
	(c) Soiled Waste <ul style="list-style-type: none"><li>- Items contaminated with blood, body fluids (Dressings, plaster casts, cotton swabs, bags containing residual/discarded blood and/or components)</li></ul>


# SCHEDULE I

## BMW Categories and their segregation, collection, treatment, processing and disposal options

Category	Type of waste	Treatment and Disposal options
<p><b>Yellow</b></p> 	<p>(d) <b>Expired or Discarded Medicines</b></p> <ul style="list-style-type: none"> <li>- Antibiotics</li> <li>- Cytotoxic drugs</li> <li>- Glass or plastic ampoules, vials etc. contaminated with cytotoxic drugs</li> </ul>	<ul style="list-style-type: none"> <li>- Cytotoxic drugs returned back to manufacturer</li> <li>- All other discarded medicines either sent back to manufacturer or disposed by incineration</li> </ul>

# SCHEDULE I

## BMW Categories and their segregation, collection, treatment, processing and disposal options

Category	Type of waste	Type of Bag/ Container	Treatment and Disposal options
<b>Yellow</b> 	(e) <b>Chemical waste</b> - Production of biological and used/ discarded disinfectants	Yellow coloured containers or non-chlorinated plastic bags	Incineration or Plasma Pyrolysis or encapsulation in hazardous waste treatment, storage and disposal facility

## SCHEDULE I


### BMW Categories and their segregation, collection, treatment, processing and disposal options

Category	Type of waste	Type of Bag/ Container	Treatment and Disposal options
<b>Yellow</b>	(f) <b>Chemical liquid waste</b> <ul style="list-style-type: none"><li>- Chemicals in production of biologicals</li><li>- Used or discarded disinfectants</li><li>- X-ray film developers</li><li>- Formalin</li><li>- Infected secretions/ body fluids</li><li>- House keeping liquids</li></ul>	Separate collection system leading to effluent treatment system	liquid waste shall be pre-treated before mixing with other waste water



# SCHEDULE I

## BMW Categories and their segregation, collection, treatment, processing and disposal options

Category	Type of waste	Type of Bag/ Container
<b>Yellow</b> 	(g) Discarded linen, mattresses, beddings contaminated with blood or body fluid	Yellow coloured non-chlorinated plastic bags or <b>suitable packing material</b>


# SCHEDULE I

## BMW Categories and their segregation, collection, treatment, processing and disposal options

Category	Type of waste	Type of Bag/ Container	Treatment and Disposal options
<b>Yellow</b> 	(h) Microbiology, Biotechnology and other clinical laboratory waste	Autoclave safe plastic bags or containers	On-site pre-treatment to sterilise with non-chlorinated chemicals as per NACO or WHO guidelines and thereafter incineration


# SCHEDULE I

## BMW Categories and their segregation, collection, treatment, processing and disposal options

Category	Type of waste	Type of Bag/ Container	Treatment and Disposal options
<b>Red</b> 	Contaminated Waste (Recyclable) - Disposable items like tubings, bottles, I/V sets, catheters, urine bags, syringes (without needles), vacutainers (with needles cut), gloves	Red coloured non-chlorinated plastic bags or containers	Autoclaving or micro-waving/ hydroclaving followed by shredding or mutilation or combination of sterilisation and shredding


# SCHEDULE I

## BMW Categories and their segregation, collection, treatment, processing and disposal options

Category	Type of waste	Type of Bag/ Container	Treatment and Disposal options
<b>White (Translucent)</b> 	Waste sharps including Metals - Needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades	Puncture proof, leak proof, <b>tamper proof</b> containers	Autoclaving followed by shredding or mutilation or encapsulation Combination of shredding cum autoclaving Final disposal to iron foundries/ sanitary landfill/ concrete waste sharp pit

# SCHEDULE I

## BMW Categories and their segregation, collection, treatment, processing and disposal options

Category	Type of waste	Type of Bag/ Container	Treatment and Disposal options
<p><b>Blue</b></p> 	<p>(a) Glassware Broken/ discarded and contaminated glass (medicine vials, ampoules) except cytotoxic wastes</p> <p>(b) Metallic body implants</p>	<p>Cardboard boxes with blue coloured marking</p>	<p>Disinfection (by soaking the washed glass waste after cleaning with detergent and Sodium Hypochlorite treatment) or through autoclaving or microwaving or hydroclaving and then sent for recycling.</p>

## TREATMENT AND DISPOSAL



- ❖ In accordance with Schedule I with standards provided in Schedule II
- ❖ No occupier shall establish on-site treatment and disposal facility, if a service of CBMWTF is available at distance of 75 km
- ❖ Phase out use of chlorinated plastic bags within 2 years
- ❖ Bags for storing and transporting BMW shall be in compliance with Bureau of Indian Standards. Till the standards are published, carry bags shall be as per the Plastic Waste Management Rules, 2011

# SEGREGATION, PACKAGING, TRANSPORTATION AND STORAGE

- ❖ Segregation at point of generation
- ❖ Containers or Bags shall be labelled as specified in Schedule IV
- ❖ Bar coding and GPS shall be added by the occupier and operator of CBMWTF within one year time
- ❖ Transport vehicle details
- ❖ Untreated human anatomical waste, animal anatomical waste, soiled waste and biotechnology waste shall not be stored beyond 48 hours
- ❖ Clinical lab waste shall be pre-treated by sterilisation to Log 6 or disinfection to Log 4 as per WHO guidelines



# SEGREGATION, PACKAGING, TRANSPORTATION AND STORAGE

## LABEL FOR TRANSPORTING BIO-MEDICAL WASTE BAGS OR CONTAINERS

Day .....Month .....

Year .....

Date of generation .....

Waste category Number .....

Waste quantity.....

Sender's Name and Address

Phone Number .....

Fax Number.....

Contact Person .....

In case of emergency please contact :

Name and Address :

Phone No.

Note :Label shall be non-washable and prominently visible.

Receiver's Name and Address:

Phone Number .....

Fax Number .....

Contact Person .....







# TATA MEMORIAL HOSPITAL, MUMBAI BIO-MEDICAL WASTE SEGREGATION CHART



<b>RED BAG</b>	<b>YELLOW BAG</b>	<b>BLUE BIN (CARDBOARD BOX )</b>	<b>SHARP CONTAINER (WHITE)</b>	<b>BLACK BAG</b>
<b>Injection Syringes (without needles), Tubings, Plastic I.V Bottles , Catheters, Plastic &amp; Rubber Hand Gloves, Urine Bags, Intravenous tubes and sets</b>	<b>Human tissues, organs, body parts and fetus, Items contaminated with blood, body fluids like dressings, plaster casts, cotton swabs. Blood bags, Cytotoxic drugs &amp; plastics contaminated with cytotoxic drugs Discarded linen, mattresses, beddings contaminated with blood or body fluid. Laboratory cultures, specimens of micro-organisms</b>	<b>Empty medicine vials (glass) and ampoules Metallic Body Implants Stained slides Unstained slides (After treating with 1 % Hypochlorite)</b>	<b>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. Broken or discarded and contaminated glass</b>	<b>Fruits, Biscuits, Kitchen Waste Vegetable Waste, Cooked Food Material</b>

# SAFETY PRECAUTIONS:

- ▶ ALL CLINICAL SAMPLES ARE POTENTIAL SOURCE OF INFECTION
- ▶ Contains infectious material
- ▶ Should be handled following universal precautions
- ▶ Universal precautions are a standard set of guidelines to prevent the transmission of blood borne pathogens from exposure to blood and other potentially infectious materials
- ▶ PPE should be used for handling of all samples
- ▶ PPE includes gloves, mask, caps, gowns, goggles or face shields
- ▶ Hand hygiene before and after

Thank You

