TRAINING ON MANAGEMENT OF BIO-MEDICAL WASTE

DEFINITION

“Bio-medical waste” means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities or in production or testing of biological or in health camps.

NEW RULES

Bio-medical Waste (Management) Rules, 2016 notified on March 28, 2016 by MoEFCC, Govt. of India under Environmental Protection Act, 1986.

Can be downloaded from ppcb website www.ppcb.gov.in
Applicability

- Hospitals
- Nursing homes
- Clinics, dispensaries
- Veterinary institutions
- Animal houses
- Pathological laboratories
- Blood banks
- Ayush hospitals,
- Clinical establishments
- Research or educational institutions
- Health camps

- Medical or surgical camps
- Vaccination camps
- Blood donation camps
- First aid rooms of schools
- Forensic laboratories
- Research labs.
Why BMW is Important

80% non infectious, (kitchen waste, paper)
15% is infectious (dressings, anatomical wastes, blood bags)
5% is non infectious but hazardous, (chemicals, drugs and mercury)

When this 20% of the hospital infectious material is mixed with 80%
Then all the 100% waste becomes hazardous and infectious, hence segregation should be at source.
Definition of Occupier

“Occupier” means a person having administrative control over the institution and the premises generating bio-medical waste, which includes a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank, health care facility and clinical establishment, irrespective of their system of medicine and by whatever name they are called.
Duties of Occupier

Rule 4.

- To ensure that waste is handled without any adverse effect to human health and the environment.
- Provision of a Final Storage Room.
- Pre-treatment of Lab waste, microbiology waste, blood bags etc.
- Phase-out use of chlorinated plastic bags, gloves and blood bags
- Providing training to healthcare workers & keep record.
- Immunize Health workers with Tetanus and Hepatitis-B vaccine
- Establish bar-code based software system.
- Pre-treatment of liquid chemical waste before mixing it with domestic liquid waste.
- Appropriate and adequate use of PPEs.
- Conduct health-checkup of health workers and keep record.
Duties of Occupier

- Display **waste management monthly record** on the HCFs website.
- Report **Major Accidents** in Form-I within 24 hrs.
- Untreated human anatomical waste, animal anatomical waste, soiled waste and, biotechnology waste shall not be **stored beyond 48 hrs**.
- **Report to PPCB** incase of irregular visit of CBWTF.
- Forming a **BMW Management committee** and hold atleast bi-annual meetings.
- The containers shall be properly **labelled**.
Waste Management Committee
( > 30 bedded Hospital)

- Medical Superintendent/SMO/Nursing Superintendent
- Hospital’s Nodal officer
- Sanitary supervisor
- Store In charge
- Epidemiology Nurse (Infection Control Nurse)
- Medical Director & Administrative Head
- Members from other departments
PERSONAL PROTECTIVE EQUIPMENT (PPEs)

- Gloves
- Mask
- Googles
- Apron
- Head Cap
- Safety Shoes
Authorisation

- It means permission granted by SPCB for generation, collection, reception, storage, transportation, treatment & disposal of Bio-medical waste.
- Every occupier or operator handling bio-medical waste, irrespective of the quantity shall make an application in Form II for authorization under BMW Rules and consent under Air Act & Water Act.
- The authorisation shall be one time for non-bedded occupiers.
Annual report

Every occupier shall submit an annual report to the prescribed authority in Form-IV, on or before the 30th June of every year, display Annual Report of the waste on the HCE’s website and make own website within 2 years.
Details to kept for filing Annual Report as per New Form-IV

- Quantity of General Waste on per month basis.
- Detail of On-site storage facility: Size & Capacity of Final Storage Room.
- Minutes of Meeting of the Bio-medical Waste Management Committee.
- Detail of BMW training conducted in HCF, no. of personnel trained, no of personnel not undergone any training.
- Detail of Accidents occurred during the year.
- Liquid waste generated and treatment methods in place.
Maintenance of Records

Every authorised person shall maintain records related to the generation, collection, reception, storage, transportation, treatment, disposal or any other form of handling of bio-medical waste, for a period of 5 years.

Components of Bio Medical Waste Management

Segregation at Source

Collection and Safe storage

Transportation

Treatment & Disposal (On-site/Off-site)
CHANGES IN COLOR CODING
COLOR CODING

Existing

- Human Anatomical Waste
- Animal Waste
- Microbiology Waste
- Soiled Waste

Addition

- Contaminated Linen, Beddings, Mattresses
- Chemical Waste (Solid)
- Blood Bag

COLOR CODING

BMW Rules, 2016

Plastic container with bag

Discarded Medicines, Cytotoxic Drugs
COLOR CODING

BMW Rules, 1998

Microbiology Waste

Solid Waste

Plastic container with bag

BMW Rules, 2016

Recyclables (All Plastic)

COLOR CODING

BMW Rules, 1998

- Sharp Waste + Broken Glass

BMW Rules, 2016

- White (Translucent PPC)
- Sharp excluding broken glass
  (No need of adding Hypochlorite solution)

COLOR CODING

BMW Rules, 1998

Solid Waste (Plastic)

Cardboard Box With Blue Marking

BMW Rules, 2016

Glassware (Broken & Unbroken)

Metallic Body Implants

# Bio-Medical Waste Management Rules, 2016

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>WASTE CATEGORIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>YELLOW</td>
<td>Anatomical Waste, Soiled Waste, Microbiology Waste, Discarded Medicines, Soiled Linen &amp; Beddings, Blood Bags, Chemical Waste</td>
</tr>
<tr>
<td>RED</td>
<td>All Recyclable (Plastic)</td>
</tr>
<tr>
<td>WHITE</td>
<td>Sharp Waste (Metals)</td>
</tr>
<tr>
<td>BLUE</td>
<td>Broken &amp; Unbroken glass and Metallic Body Implants</td>
</tr>
</tbody>
</table>
CATEGORIES

BMW Rules, 1998

10 Categories
- Human Anatomical Waste
- Animal Waste
- Microbiology & Biotechnology Waste
- Waste sharps
- Discarded Medicines and Cytotoxic drugs
- Soiled Waste
- Solid Waste
- Liquid Waste
- Incineration Ash
- Chemical Waste

BMW Rules, 2016

4 Categories
- Yellow
- Red
- White
- Blue

Yellow Category

Human Anatomical Waste (human tissues, organs, fetus below viability period)
Yellow Category

Animal Anatomical Waste (like Animal tissues, Organs, Body Parts, Bleeding Parts, Fluid, Blood and Experimental Animals Used in Research) Waste Generated by Veterinary Hospitals Colleges or Animal Houses
Yellow Category

Soiled Waste (Items contaminated with blood and body fluids including cotton dressings, soiled plaster casts, cotton swabs and bags containing residual or discarded blood and blood components)
Yellow Category

Expired or Discarded Medicines (Pharmaceutical waste)
Like antibiotics, cytotoxic drugs including all items contaminated with cytotoxic drugs along With glass or plastic ampoules, vials etc.
Yellow Category

- **Chemical Solid Waste** (Chemicals used in production of biological and used or discarded disinfectants).

Yellow Category

**Chemical Liquid Waste** (Chemicals used in production of biological and used or discarded disinfectants. Liquid waste generated due to use of chemicals, discarded disinfectants, silver x-ray film, developing liquid, formalin, aspirated body fluids, liquid from labs, floor washing, cleaning, house-keeping and disinfecting activities.)
Yellow Category

Discarded Linen, mattresses contaminated with blood/body fluid

Yellow Category

Microbiology, Bio-technology and other clinical Lab waste (Blood bags, Laboratory cultures, stocks or specimens of micro-organisms, 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
Red Category

Contaminated Waste (Recyclable) Wastes generated from disposable items such as tubing, bottles, intravenous tubes and sets, catheters, urine bags, syringes (without needles and fixed needle syringes) and vaccutainers with their needles cut) and gloves.
White (Translucent) Category

Waste Sharps including Metals Needles, syringes with fixed 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 Category

Glassware & Metallic Body Implants Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic waste.
SEGREGATION

COLOR CODED BINS

Yellow Bag & Bin

Red Bag & Bin

White (Translucent) PPC

Blue Marking Cardboard Box

DISPOSABLES

Non-Chlorinated Plastic Bag of 50 Microns

Non-Chlorinated Plastic Bag of 50 Microns

Translucent Puncture Proof Container

Blue Marking Cardboard Box

YELLOW NON-CHLORINATED BAG/BIN

- Human Anatomical Waste
- Soiled Waste
- Discarded Linen, mattresses

Microbiology, Biotechnology and Lab waste

Animal Anatomical Waste

Chemical Waste

SEPARATE YELLOW NON-CHLORINATED BAG/BIN

Expired or Discarded Medicines, Cytotoxic Drugs

There will be no chemical pre-treatment before incineration, except for microbiological, lab and highly infectious waste.

RED NON-CHLORINATED BAG/BIN

Contaminated Waste (Recyclable)

Cutting/
Mutilation

WHITE (TRANSLUCENT) PUNCTURE PROOF CONTAINER

Waste Sharps including Metals

BLUE CARDBOARD BOX

Glassware & Metallic Body Implants

### SEGREGATION OF WASTE IN COLOR CODED BAGS

<table>
<thead>
<tr>
<th>YELLOW BAGS</th>
<th>RED BAGS</th>
<th>WHITE TRANSLUCENT PPC</th>
<th>BLUE MARKING CARDBOARD BOX</th>
<th>GREEN CONTAINER</th>
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</thead>
<tbody>
<tr>
<td><strong>Anatomical Waste, Soiled Waste, Microbiology &amp; Lab Waste, Discarded Medicines, Cytotoxic Drugs, Soiled Linen &amp; Beddings, Blood Bags and Chemical Solid Waste</strong></td>
<td><strong>Plastic Waste such as catheters, urine bags, syringes (without needles) and vaccutainers with their needles cut</strong></td>
<td><strong>Sharp Waste including metals like Needles, syringes with fixed needles, needles from needle tip cutter or burner, scalpels, blades etc.</strong></td>
<td><strong>Broken or discarded and contaminated glass including medicine vials and ampoules except those contaminated with cytotoxic wastes.</strong></td>
<td><strong>General Waste like paper, kitchen waste, wrappers etc.</strong></td>
</tr>
</tbody>
</table>

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Chemical Liquid Waste

Chemical treatment using at least 10% Sodium Hypochlorite having 30% residual chlorine for twenty minutes

Pre-Treatment

Final Treatment

Effluent treatment system

10% Sodium Hypo-chlorite Solution

AUTOMATED LIQUID WASTE TREATMENT SYSTEM FOR PRE-TREATMENT

Effluent Treatment Unit for Liquid Medical Waste

To,
All HCF and Blood Banks
Punjab

As per the Bio-Medical Waste (Management & Handling) Rules, 1998, liquid biological waste such as ascetic, pleural and cancer fluids (AF/FP and CF), HBsAg+ve blood bags are required to be chemically treated and disinfected before its disposal. The hospitals and health care facilities incur substantial cost for this. Improper treatment may cause environmental damage and/or impact the health of the people exposed to it.

Punjab Pollution Control Board has authorized Yashraj Biotechnology Ltd. (YBL) to collect liquid biomedical waste from Healthcare facilities and Blood banks in Punjab State. Yashraj Biotechnology Ltd is into Research and Development of indigenous process for purification of native antigens from human biological source. These are essential ingredients in developing cost effective diagnostic tests for human health care purposes.

YBL has achieved very encouraging results in purifying some proteins from the biomedical fluids. However, the quantities of the antigens in the fluids are very small and there are significant loses during the cumbersome, multistage purification processes. This necessitates continuation of Research and Development and need to source quantities of biomedical fluids on continued basis.

In view of the above, all HCF are requested to provide liquid waste to our representative from our collection centers in the State of Punjab. If you need any other details we would be happy to provide it.
Collection and Packaging
GOOD PRACTICES

Bags to be filled with only 2/3rd capacity
SCHEDULE - IV

LABEL FOR BIO-MEDICAL WASTE CONTAINERS / BAGS

HANDLE WITH CARE
Label shall be non – washable and prominently visible

Storage
NON-BEDDED HCFS OR HCFS HAVING LOW QUANTITY OF WASTE GENERATION CAN USE PLASTIC CONTAINER WITH VENTILATED LID & LOCK & KEY FACILITY.

Transportation
Treatment and Disposal
Common Bio-Medical Waste Treatment Facilities in the State of Punjab

- M/s Medicare Env. Management, Ludhiana
- M/s Rainbow Environments, SAS Nagar
- M/s Amritsar Enviro Care System, Amritsar
- M/s Bio Medical Treatment Plant, Pathankot
Contaminated Waste (Recyclable)

Waste Sharps including Metals

• Human anatomical waste
• Animal waste
• Soiled Waste
• Expired or Discarded medicines

Chemical Waste

Discarded linen, mattresses, beddings contaminated with blood or body fluid.

Microbiology Waste, Biotechnology Waste

Incineration plant

Incinerator

Exhaust air

Scrubber

Treated air

atmosphere

Collection Vehicles

Auto clave

Disinfected waste

Landfill

Shredder

Shredded waste

Recycling

### RATES FOR COLLECTION, TRANSPORTATION & DISPOSAL OF BIO-MEDICAL WASTE BY CBWTF

<table>
<thead>
<tr>
<th>S.N. No.</th>
<th>No. of Beds/Patients</th>
<th>Revised rates in Rupees</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>OPD/ Clinics/ Labs/Nursing homes/HCEs less than 10 beds</td>
<td>Rs. 1000/- per month</td>
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<tr>
<td>2</td>
<td>HCFs from 11-20 beds</td>
<td>Rs. 4.20/- per bed/day</td>
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<tr>
<td>3</td>
<td>HCFs from 21 beds and above</td>
<td>Rs. 5.40/- per bed/day</td>
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</table>

- The Rates will take in to effect from 01.01.2014 and taxes are extra.
- There will be an annual increment of 7% on previous year’s rates and applicable from 1\(^{st}\) of January every year.
- The Rates from dental chairs in dental clinics/dental college & hospitals will be taken considering them at par with hospital beds.
BAR CODE Based Software system

- All the 4 CBWTFs are implementing Real Time collection system using this software for more efficient collection of Bio-Medical Waste.

- Merits of the new system:
  - Accurate data available.
  - Reports can be generated on daily basis.
  - It can be assured that the BMW is being treated in 48 Hrs.
PASTING OF BAR-CODE STICKER
Login Area

If you are a current member, log in using the form below. If you are not a member, please click on the link below to join.

**User Id**

Note: New members, please click here to register

Membership Info

You are invited to join kyb.in site. Membership pricing is based on State and Bed-Strength as below.

- 0 to 10 Beds: Rs.572/year
- 11 to 50 Beds: Rs.1145/year
- 51 and above Beds: Rs.1717/year

Within the kyb.in Members Access Area you’ll find:

- Bio-Medical Waste Date Wise Report
- Bio-Medical Waste Month Wise Report
- Bio-Medical Waste Year Wise Report
- Request Barcode Stickers
- Request Consumable Items

If you are interested in Membership to kyb.in, we invite you to join today. Please click on the link to the left to join.
## Monthly Record of BMW Generation be updated on HCF’s website

### Bio-Medical Waste Management Rules, 2016

#### BMW Collection Report [Client Wise] [Date Wise] in kgs

- **Town**: Mohali  
- **Client**: CIVIL HOSPITAL MOHALI
- **Date from**: 26-11-2015  
- **To**: 03-12-2015

#### BMW Collection Report (Client Wise) (Date Wise) in kgs

**RAINBOW ENVIRONMENTS**

- **Contact Person**: SMO. INCH. ANDESH KANG  
- **Client Name**: CIVIL HOSPITAL MOHALI  
- **Bed Capacity**: 170  
- **Date From**: 26-Nov-2015  
- **To**: 03-Dec-2015

<table>
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</table>
Online Authorization

- Punjab Pollution Control Board has introduced online system for Bio-Medical Waste authorization.
- Now Health Care Facility can apply for fresh/renewal of authorization online from anywhere and can check status of its application.
- For applying online visit www.ppcb.gov.in and then click on Online Consent Management & Monitoring System.
Procedure for online application

Click Here

# Total Registered Industries : 2374
# Total Consent Applications
Various public notices issued

Contents of Mercury spill kit

- Apron
- Gloves
- Mercury Bottle half filled with water
- Bleaching Solution/Sodium Thio-sulphate solution
- Two cards/X-ray films
- Masks

Mercury Waste Disposal Options

Store the Collected Hg spill in a designated area

Disposal of X-Ray Films & Hypo-Fixer

- M/s Malana Silver Nitrate Recycling Unit, Village Rampur Gujjran, Tehsil Moonak, Distt. Sangrur (Vikram-9464043172) has been authorized by PPCB for lifting and disposal of waste generated from hypo-fixer solution and X-ray films.
RATES FOR DISPOSAL OF X-RAY FIXER & FILMS

• Registration Rates-
• Less than 50 beds - Rs 4000/ per 5 years
• 50-99 Beds - Rs 5000/ per 5 years
• 100 beds and above - Rs 6000/ per 5 years
Commonly observed violations

Mismatch Coloured Bags/Containers
Poor Segregation and the provision
Improper Transportation of BMW
Mixing of general and healthcare waste and animals feeding on it

Open Burning of Waste which may lead to Dioxins and Furans
Commonly observed violations

- Expired Agreement with CBWTF
- Disposing waste Using Deep Burial System.
- Improper Segregation.
- Non-Obtaining/Expired Authorization, Consents from PPCB.
- Untreated human anatomical waste, animal anatomical waste, soiled waste and, biotechnology waste stored beyond a period of 48 hours.
- No pre-treatment to Microbiology waste and other clinical laboratory waste by sterilisation
- Plastic Biomedical Waste not Cut before disposal.
- No pre-treatment & treatment provided to liquid waste generated in the HCF.
- Bar-Code Stickers not pasted on the Color Coded bags/Puncture proof Sharp Container.
Commonly observed violations

- Chlorinated Yellow & Red Color coded bags used for disposal of waste.
- Not Submitting **Annual Report** under Bio-Medical Waste Management Rules / Submitting Annual Report after 30th June to Punjab Pollution Control Board.
- Not uploading **Annual Report** on the HCF’s website.
- Non-maintaining the bio-medical waste management **register** and display the monthly record on HCF’s website.
- Non-reporting of **major accident** occurred during handling of bio-medical in HCF within 24 hrs in Form-1.
Commonly observed violations

- Improper Disposal of Placenta.
- Common Storage Room without Lock and Key, improper lightning and ventilation arrangements, lack of Impervious floor, access to rodents.
- Non-constitution of bio-medical waste management committee.
Non Compliance of Rules

- In case of any non-compliance of the Bio-Medical Waste (Management) Rules, 2016, the occupier is liable for penalty for contravention of the provisions of the Act and the Rules, orders and directions as specified in Rule 15. of the E(P)Act, 1986 which states that “whosoever fails to comply or contravenes any of the provisions of the Act and the Rules, orders and directions be punishable with imprisonment for a term which may extend to five years or with fine which may extend to one lakhs rupees or both”
Non Compliance of Rules by Govt. Departments

- In case of non-compliance by any Govt. Departments, the Head of Department shall be deemed to be guilty of the offence and shall be liable to be proceeded against and punished accordingly as specified in Rule 17. of E(P)Act, 1986.
Unauthorized disposal of Bio-Medical Waste to General Waste Handlers (Kabarias)

Thanks