

Training and Management of Bio - medical waste



Its training Session of
Sangam Mediserve Pvt. Ltd.



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.**

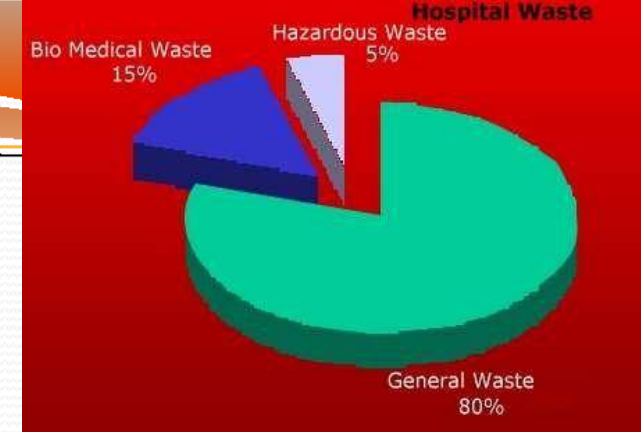


Applicability



- ✓ 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

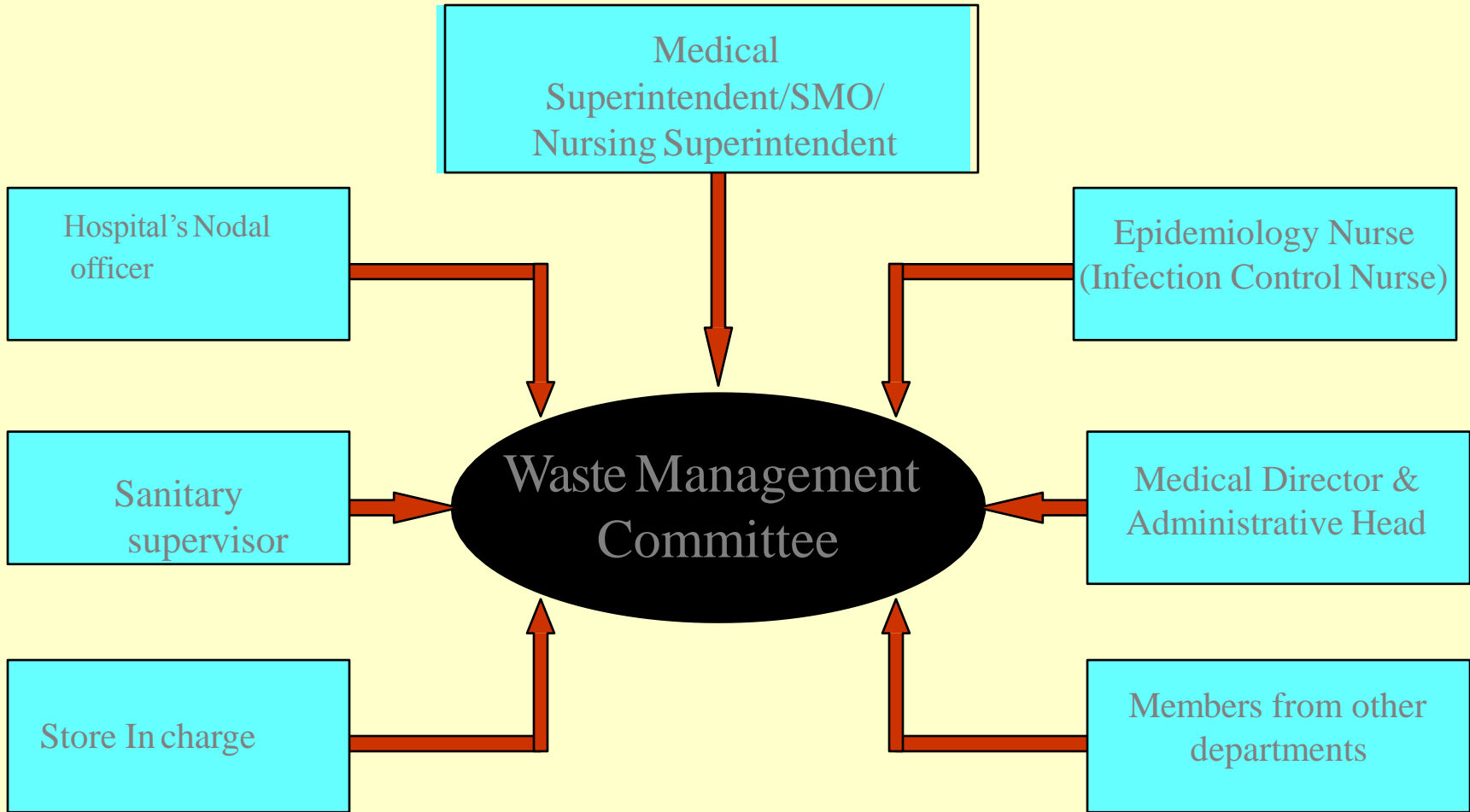
- ❑ Display waste management monthly record on the HCFs website.
- ❑ Report Major Accidents in Form-I within 24 hrs.
- ❑ Untreated human anatomical waste, animal anatomical waste, soiled waste and, biotechnology waste shall not be stored beyond 48 hrs.
- ❑ Report to PPCB incase of irregular visit of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



Bio-Medical Waste Management Rules, 2016



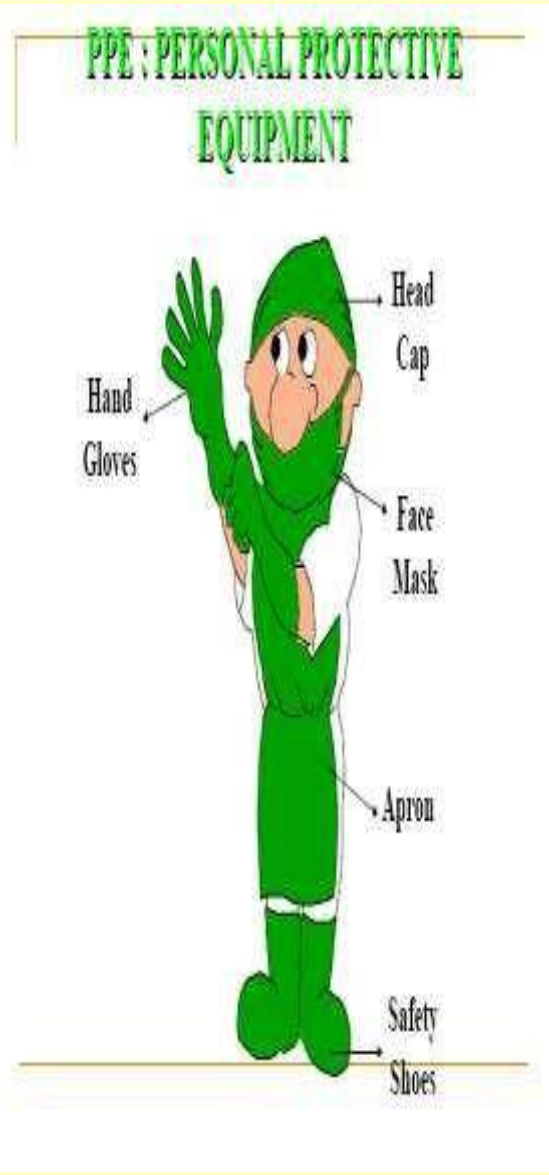
Waste Management Committee (> 30 bedded Hospital)





Towards Healthy Future

PERSONAL PROTECTIVE EQUIPMENT (PPEs)



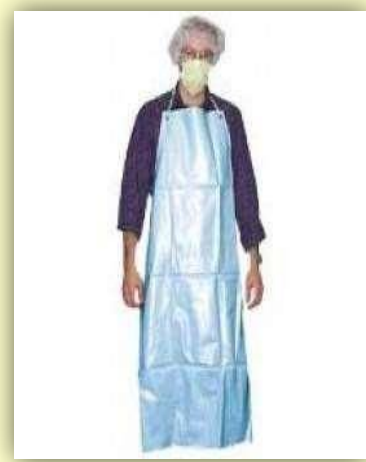
GLOVES



MASK



GOOGLES



APRON



HEADCAP



SAFETYSHOES



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

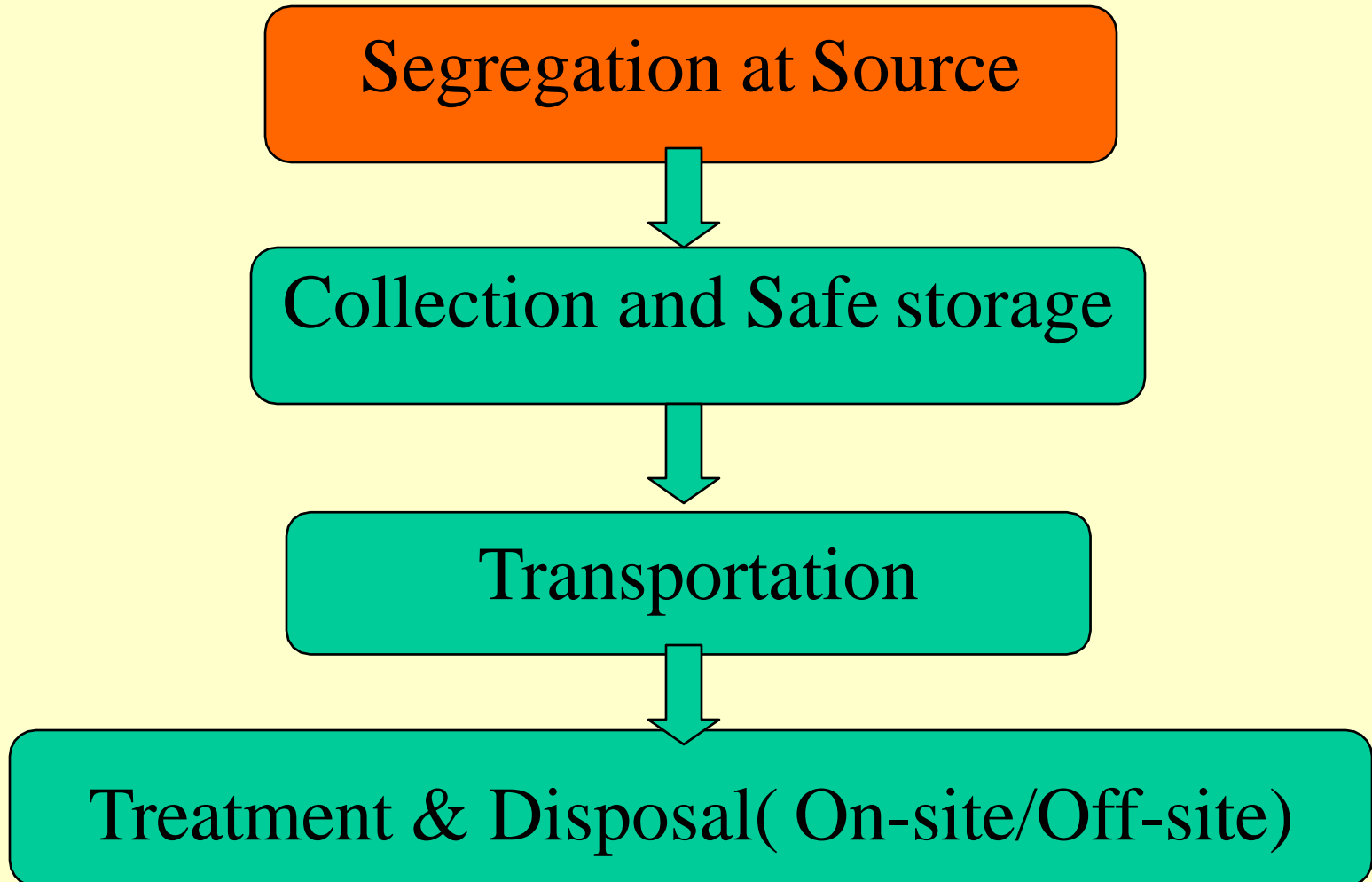
- ❑ Quantity of General Waste on per month basis.
- ❑ Detail of On-site storage facility: Size & Capacity of Final Storage Room.
- ❑ Minutes of Meeting of the Bio-medical Waste Management Committee.
- ❑ Detail of BMW training conducted in HCF, no. of personnel trained, no of personnel not undergone any 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



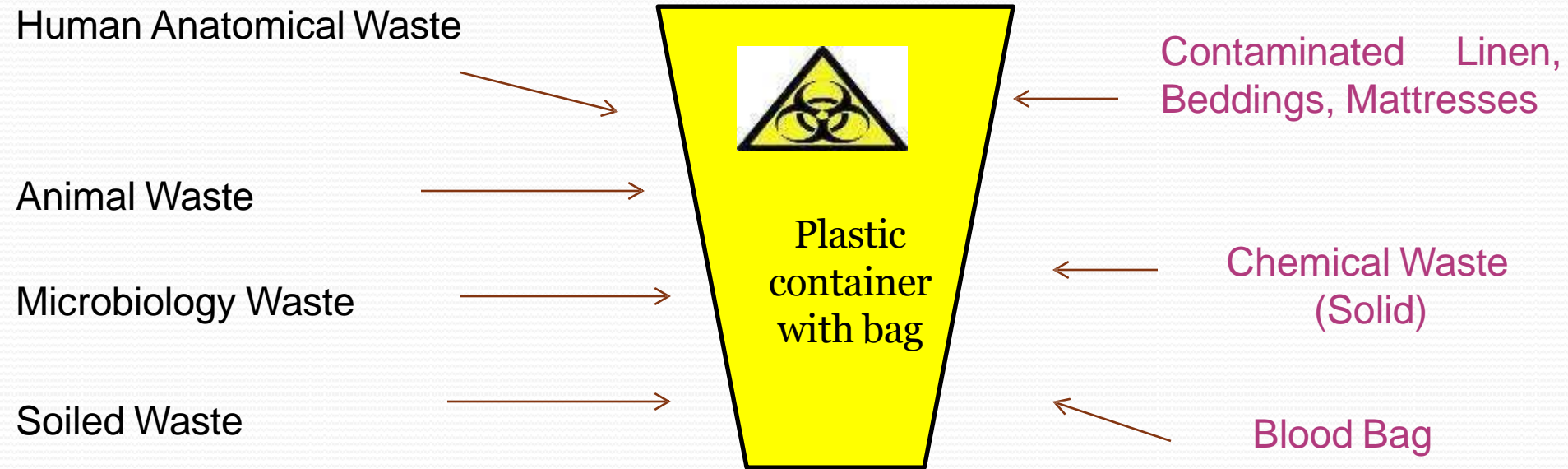


CHANGES IN COLOR CODING

COLOR CODING

Existing

Addition

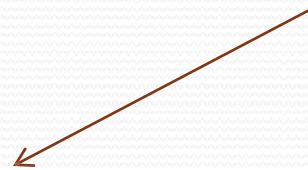


COLOR CODING

BMW Rules, 2016



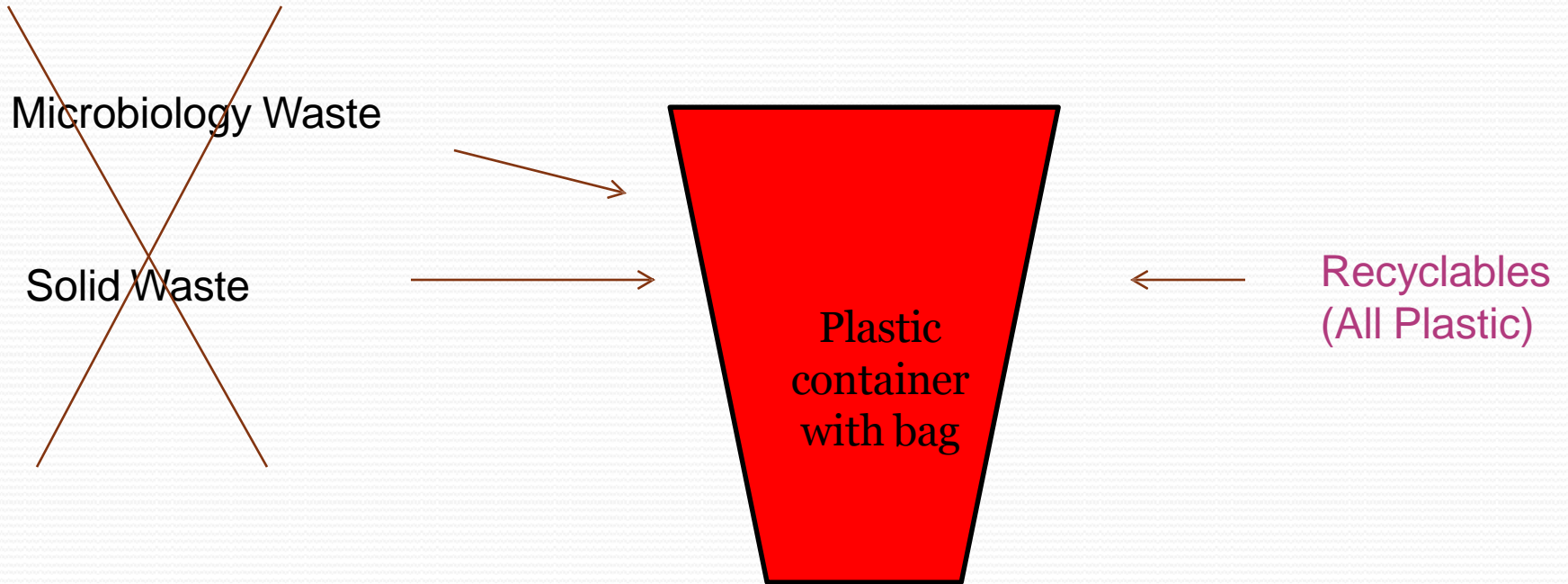
Discarded Medicines,
Cytotoxic Drugs



COLOR CODING

BMW Rules, 1998

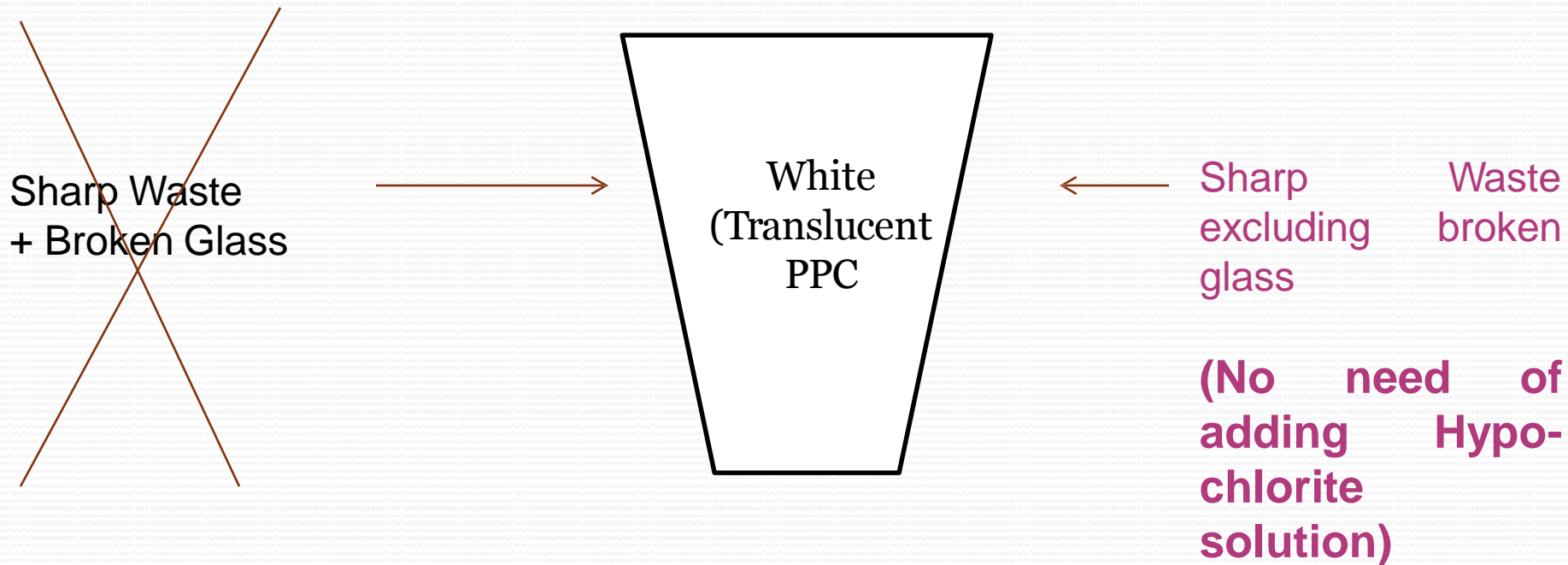
BMW Rules, 2016



COLOR CODING

BMW Rules, 1998

BMW Rules, 2016

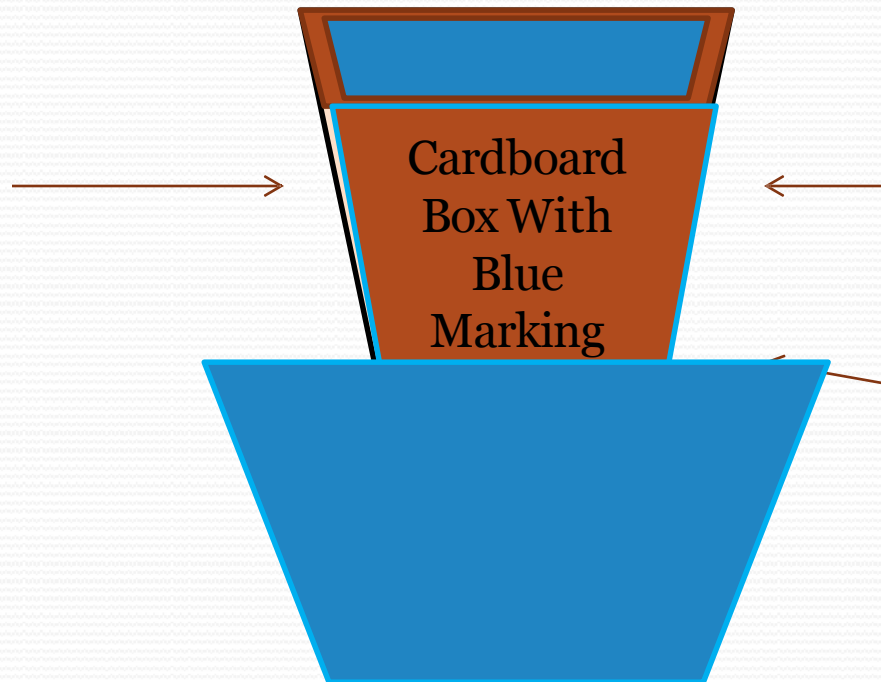


COLOR CODING

BMW Rules, 1998

BMW Rules, 2016

~~Solid Waste
(Plastic)~~



Glassware
(Broken & Unbroken)

Metallic Body Implants



SUMMARY

YELLOW CATEGOR Y

- **Anatomical Waste**
- **Soiled Waste**
- **Microbiology Waste**
- **Discarded Medicines**
- **Soiled Linen & Beddings**
- **Blood Bags**
- **Chemical Waste**

RED CATEGORY

**All Recyclable
(Plastic)**

White Category

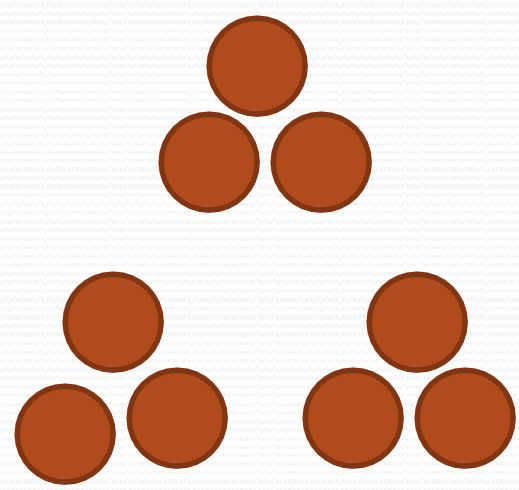
**Sharp Waste
(Metals)**

Blue Category

**Broken &
Unbroken glass
and Metallic
Body Implants**



CATEGORIZATION





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.)



Hydroxides



Anorganic or organic acids or solutions of heavy metals



Developer



Solvents halogen poor or Oil



Solvents halogen rich



Fixative or nitric acids



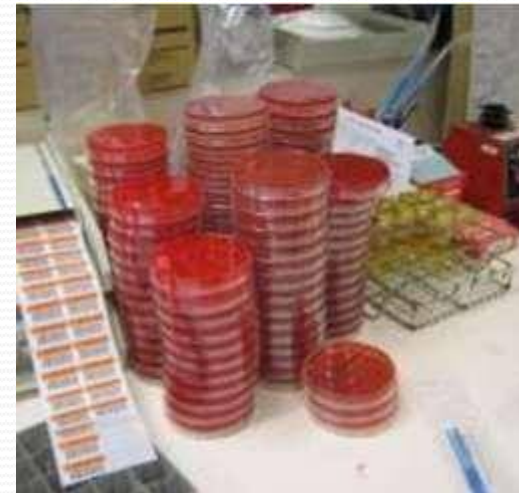
Yellow Category

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.





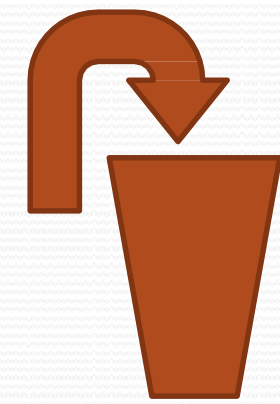
Blue Category

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**

**TRANSLUCEN
T PUNCTURE
PROOF
CONTAINER**

**BLUE
MARKIN
G
CARDBOARD
BOX**

YELLOW NON-CHLORINATED BAG/BIN



Human Anatomical Waste



Soiled Waste



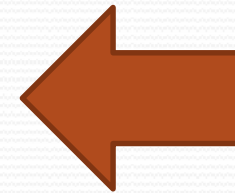
Discarded Linen, mattresses



Chemical Waste



**Microbiology,
Biotechnology and Lab
waste**



**Animal Anatomical
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

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



Chemical Liquid Waste



Pre-Treatment

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

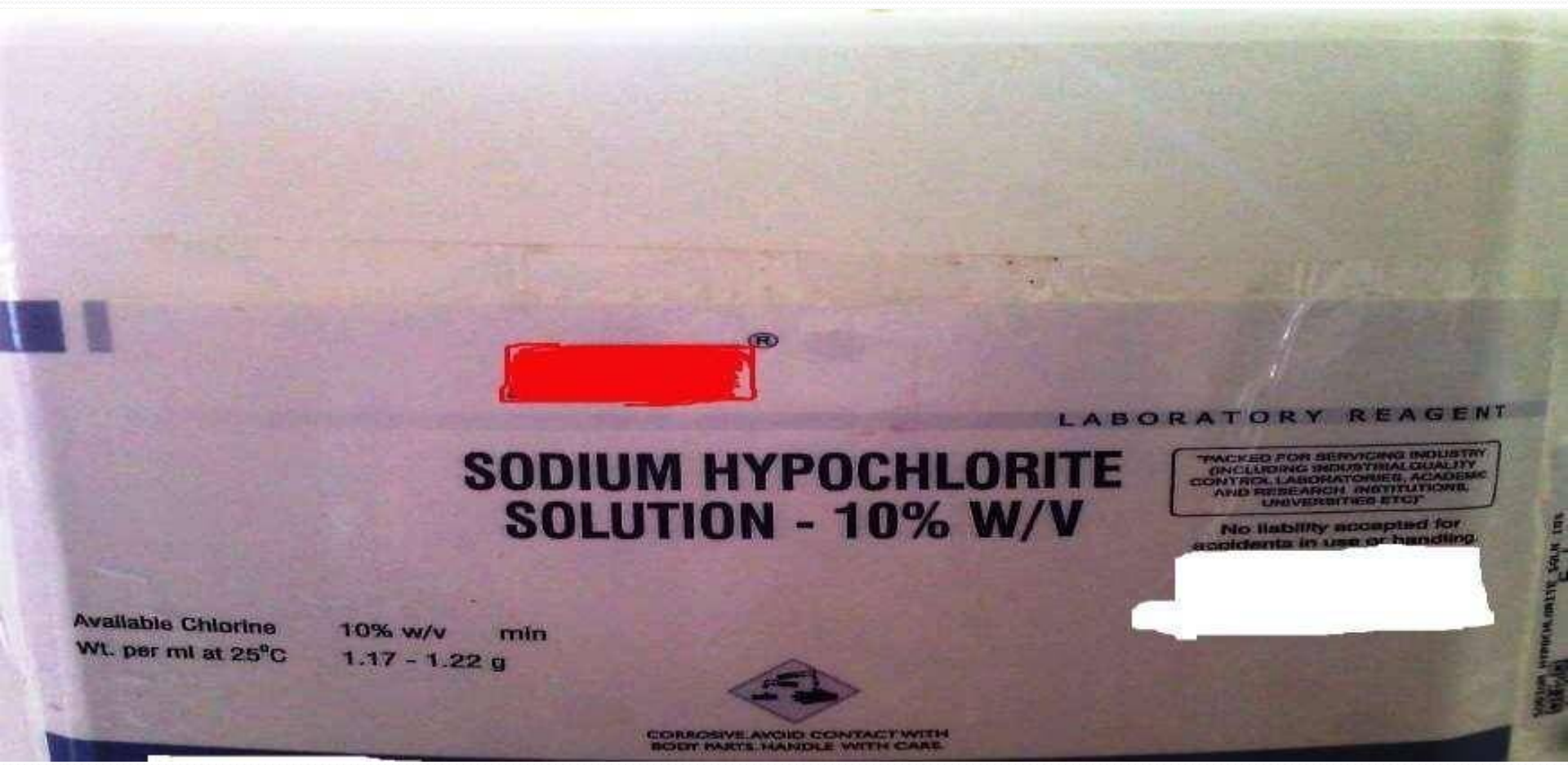
Final Treatment

Effluent treatment system



Towards Healthy Future

10% Sodium Hypo-chlorite Solution



LABORATORY REAGENT

**SODIUM HYPOCHLORITE
SOLUTION - 10% W/V**

TRACKED FOR SERVICING INDUSTRY
(INCLUDING INDUSTRIAL QUALITY
CONTROL LABORATORIES, ACADEMIC
AND RESEARCH INSTITUTIONS,
UNIVERSITIES ETC)

No liability accepted for
accidents in use or handling



Available Chlorine 10% w/v min
Wt. per ml at 25°C 1.17 - 1.22 g

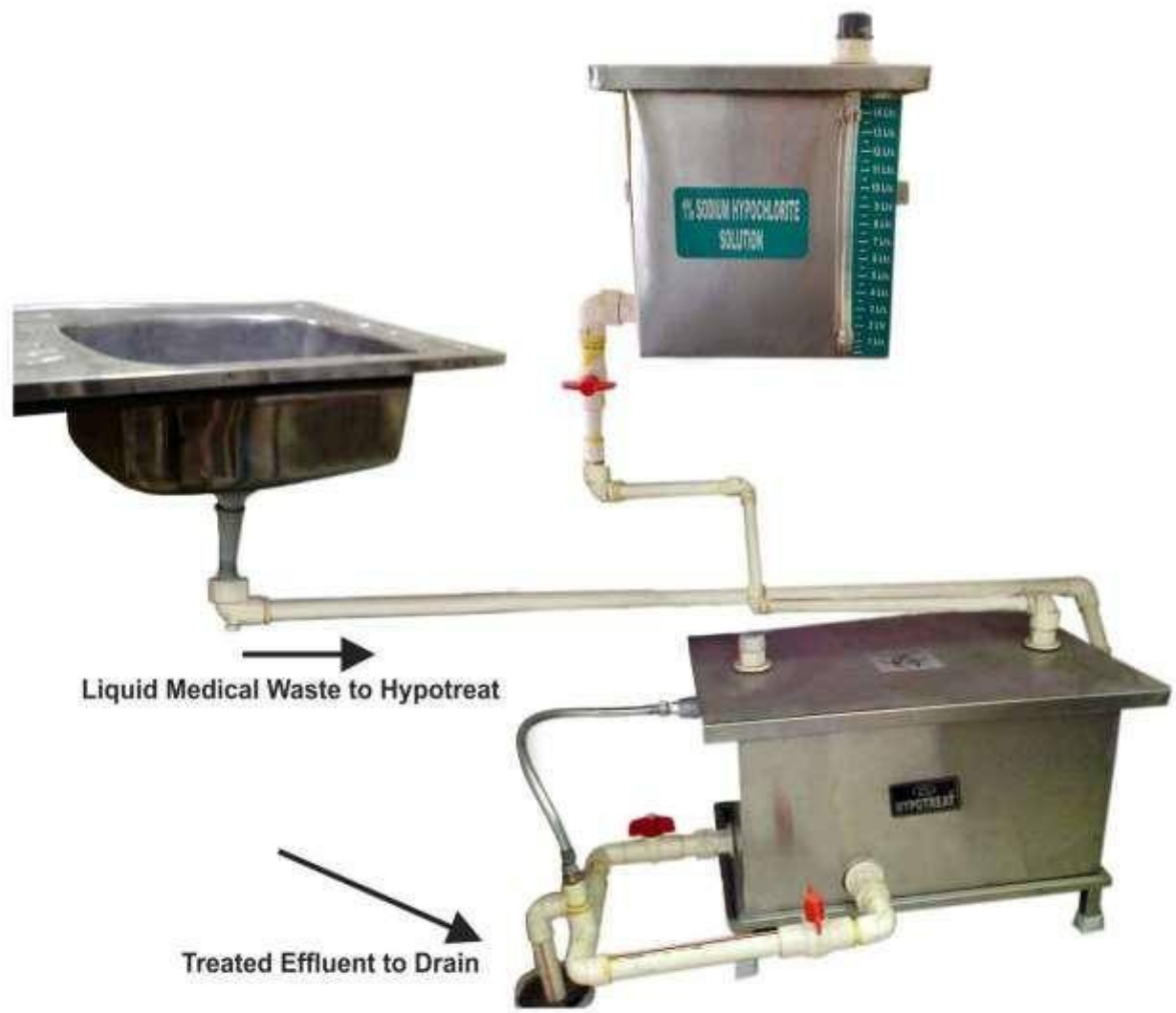


CORROSIVE/ACID CONTACT WITH
BODY PARTS. HANDLE WITH CARE.



Towards Healthy Future

AUTOMATED LIQUID WASTE TREATMENT SYSTEM FOR PRE-TREATMENT



Effluent Treatment Unit for Liquid Medical Waste
Bio-Medical Waste Management Rules, 2016



Collection and Packaging



SCHEDULE - IV

LABEL FOR BIO-MEDICAL WASTE CONTAINERS / BAGS



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

Segregation Poster

BIO-HAZARD Bio Medical Waste Container BIO-HAZARD

जीव चिकित्सा अपशिष्टों के व्यवहन के लिए रंग कोड और आधान

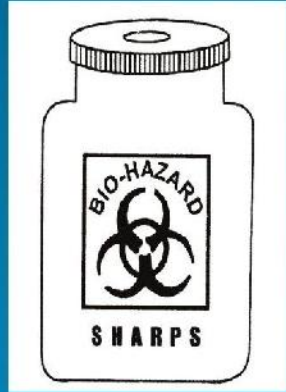
पंचर प्रूफ कन्टेनर
में निम्नलिखित समान ही डालें।

लाल डिब्बे
में निम्नलिखित समान ही डालें।

नीले डिब्बे
में निम्नलिखित समान ही डालें।

पीले डिब्बे
में निम्नलिखित समान ही डालें।

काले डिब्बे
में निम्नलिखित समान ही डालें।



सूईयाँ, ब्लैड, काँच की स्नाइड, कील, ऑपरेशन के नॉकदार औजार एवं नीडिल टिप व अन्य किसी भी प्रकार की ऐसी वस्तु जो काट सकती है या छेद कर सकती है।



ब्लड बैग, कांच एवं प्लास्टिक की बोतल यूरिन बैग, कैथिटर ट्यूब और सेट्स, सिरिन्ज (बिना नीडिल) फिक्सड नीडिल सिरिन्ज ग्लब्ज (दस्ताने) वेक्यूटेनर्स



टूटा फूटा कन्टामिनेटेड (संदूषित) कांच दवाइयों की शीशियाँ एवं दवाओं के रैपर आदि धातु की बाडी वाले इम्प्लांट



मानव शरीर के अंग, मानव ऊतक, रूई, पट्टियाँ वेडिंग्स (खून से सनी) बीजाण्डासन (प्लेसेन्टा), रोगयुक्त अंग, ठोस प्लास्टर, एक्सपायर एवं डिसकार्डिड मेडिसिन, जानवरों के शरीर का अविशिष्ट, केमिकल वेस्ट सूक्ष्म जैविक अवशेष



पोछा, साधारण कचरा, सफाई की गई मिट्टी, पोछा, खाने की जगहों से निकलने वाले पत्तल, ग्लास इत्यादि, बचा हुआ खाना, केले के छिलके, गत्ते व धातु के डिब्बे, खराब फल खाने की वस्तुएँ, प्लास्टर, कागज असंक्रामित प्लास्टिक, डाइपर, टिसु, भण्डारण कक्ष में एकत्रित किए जाने वाला कचरा इत्यादि



Storage

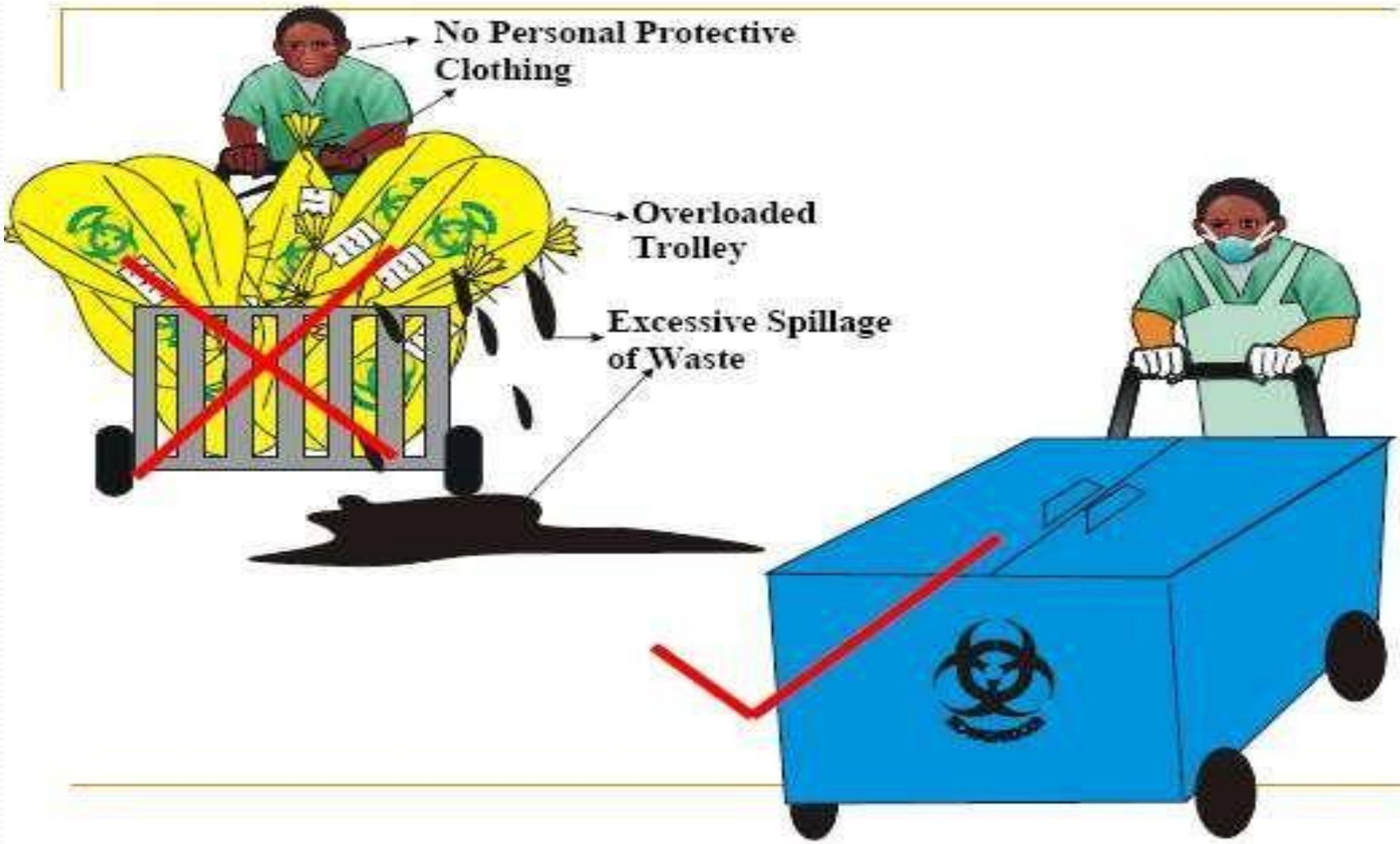


NON-BEDDED HCFS OR HCFS HAVING LOW QUANTITY OF WASTE GENERATION CAN USE PLASTIC CONTAINER WITH VENTILATED LID & LOCK & KEY FACILITY.

Bio-Medical Waste Management Rules, 2016



Transportation







Treatment and Disposal



Towards Healthy Future

Common Bio-Medical Waste Transportation



Shot on Y15
Vivo AI camera



- Contaminated Waste (Recyclable)
- Waste Sharps including Metals

Autoclave



Disinfected waste

Shredder



Recycling



Shredded waste

Landfill



Collection Vehicles



- 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, Bio-technology Waste

Bottom ash

Incineration plant

Incinerator



Scrubber



Exhaust air

Treated air

atmosphere



Incinerator







EFFLUENT TREATMENT PLANT 50 KL/ Day



100% waste water generated from process or washing is treated and reuse in the Incinerator..

AUTOCLAVE AND SHREDDER





Sangam Mediserve Pvt. Ltd.
Incinerator



SANGAM MEDISERVE PVT. LTD.



Sangam Mediserve Pvt. Ltd. - Allahabad
ETP, Vehicle stand shed, Vehicle washing area
Green Belt, Transformer and DG Set



**SANGAM MEDISERVE PVT. LTD - ALLAHABAD
ADMINISTRATIVE BLOC AND GREEN BELT.**

BAR CODE Based Software system

- Implementing of 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.



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



Commonly observed violations

- Mixing of Bio-Medical Waste with General Waste.





Towards Healthy Future

Mismatch Coloured Bags/Containers



Poor Segregation and the provision



Improper Transportation of BMW





Open Burning of Waste which may lead to Dioxins and Furans



Mixing of general and healthcare waste and animals feeding on it



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.



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Unauthorized disposal of Bio-Medical Waste to General Waste Handlers (Kabarias)





Thanks

Its Presentation of Sangam Mediserve Pvt. Ltd.