

Biomedical waste and its Management



BIO-MEDICAL WASTE

Definition

- Anything tested or used on an individual, or any trash from biological experiments are medical waste

Generated from

- Waste generated by health care facility
- Research facility
- Laboratories

Hazardous health care waste

- 85% waste is non infectious
- 10% are infectious
- 5% are hazardous



BIOMEDICAL WASTE

HOSPITAL
WASTE

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graph TD; HW[HOSPITAL WASTE] --> I[INFECTIVE]; HW --> NI[NON-INFECTIVE]; I --> IS[SOLID]; I --> IL[LIQUID]; NI --> NIS[SOLID]; NI --> NIL[LIQUID];
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INFECTIVE

SOLID

LIQUID

NON-
INFECTIVE

SOLID

LIQUID

Biomedical waste Statistics

- **Developed Countries-** 1-5 kg/bed/day, with variations among countries.

In India-

- 1-2 kg/bed/day with variation among Govt. and Private establishments.
- Approximately 506.74 tons/ day wastes generated
- Out of which only 57% waste undergoes proper disposal



Classification of Waste Category as per WHO standard

WASTE CATEGORY	TYPE OF WASTE	Examples
Category No. 1	Human anatomical waste	Tissues, organs, body parts
Category No. 2	Animal waste	Generated during research/experimentation, from veterinary hospitals
Category No.3	Microbiology and biotechnology waste	Laboratory cultures, micro-organisms, human and animal cell cultures, toxins
Category No. 4	Waste sharps	hypodermic needles, syringes, scalpels, broken glass
Category No. 5	Discarded medicines and cyto-toxic drugs	X-rays, Cancer chemotherapy

Cont....

WASTE CATEGORY	TYPE OF WASTE	Examples
Category No. 6	Soiled Waste	Dressing, bandages, plaster casts, material contaminated with blood
Category No. 7	Radioactive Components	Radiotherapy/lab research liquids Contaminated glass wares, packages, absorbent papers
Category No. 8	Liquid Waste	Generated from any of the infected areas
Category No. 9	Incineration Ash	
Category No. 10	Chemical Waste	Alcohol, Sulphuric acid, chlorine powder, Glutaraldehyde, Picric acid, fertilizer, ammonia

PROBLEM ASSOCIATED WITH BMW

ORGANISM	DISEASES CAUSED	RELATED WASTE ITEM
<u>VIRUSES</u> HIV, Hepatitis B, Hepatitis A,C, Arboviruses, Enteroviruses	AIDS, Infectious Hepatitis, Japanese encephalitis, tick-borne fevers, etc.	Infected needles, body Fluids, Human excreta, Blood.
<u>BACTERIA</u> <i>Salmonella typhi</i> , <i>Vibrio cholerae</i> , <i>Clostridium Tetani</i> , <i>Pseudomonas</i> , <i>Streptococcus</i>	Typhoid, Cholera, Tetanus, Wound infections, septicemia, rheumatic fever, skin and soft tissue infections	Human excreta and body fluid in landfills and hospital wards, Sharps such as needles, surgical blades in hospital waste.



ORGANISM	DISEASES CAUSED	RELATED WASTE ITEM
<u>PARASITES</u> Plasmodium	Cutaneous leishmaniasis, Malaria	Human excreta, blood and body fluids in poorly managed sewage system of hospitals.







OBJECTIVE OF BMW MANAGEMENT

- To minimize the production/generation of infective waste.
- Recycle the waste after to the extent possible
- Treat the waste by safe environment friendly/acceptable methods.
- Adequate care in handling to prevent health care associated infections.
- Safety precautions during handling the BMW.



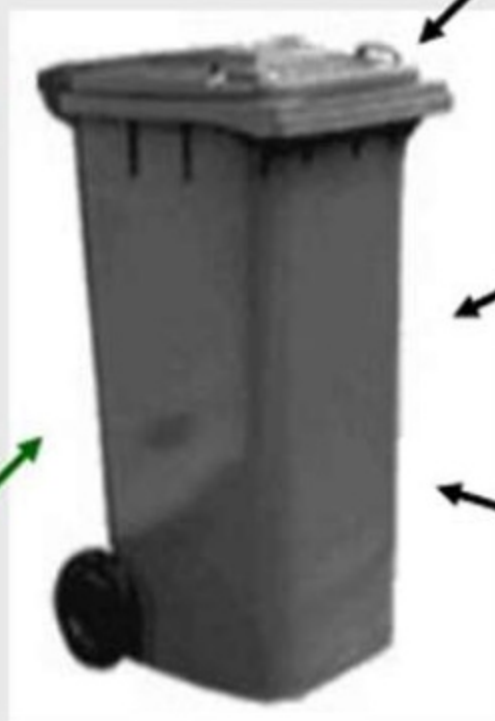
COLOUR CODING OF BAGS

COLOR CODE	TYPE OF CONTAINER	WASTE CATEGORY	TREATMENT OPTIONS
Yellow 	Plastic bags	1, 2, 3 and 6	Incineration
Red 	Disinfected container/plastic bag	3, 6 & 7	Autoclaving/Micro Waving/Chemical treatment
Blue/white transparent 	Plastic bags/puncture proof container	4 & 7	Autoclaving/Micro waving/chemical treatment, Destruction & shredding
Black 	Plastic bag	5, & 9, AND 10 (SOLID)	Disposal in secured land fills

WASTE DISPOSAL



KITCHEN WASTE/FOOD



BLACK BIN



WASTE DISPOSAL



Swab stick-
decontaminated



SWABS



soiled linen,
contaminated
gowns,
drapes

Pathology waste



Human anatomical
waste-placenta



Dressing

Bandages



YELLOW BIN

WASTE DISPOSAL



Plastic culture plates & tubes



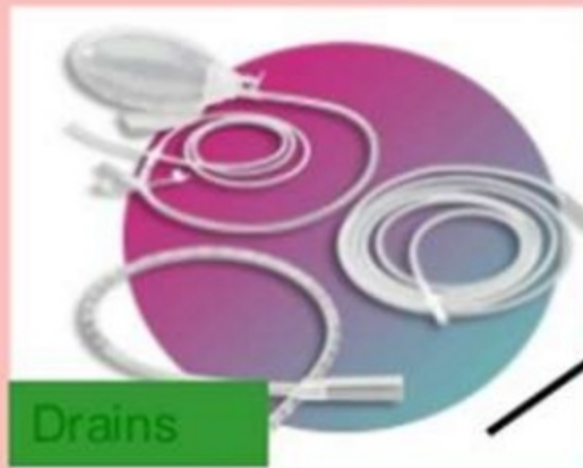
All infectious, non sharp plastic waste



Urine bag



RED BIN



Drains



IV sets



LABEL FOR BIO-MEDICAL WASTE CONTAINERS/BAGS

BIOHAZARD SYMBOL



CYTOTOXIC HAZARD SYMBOL



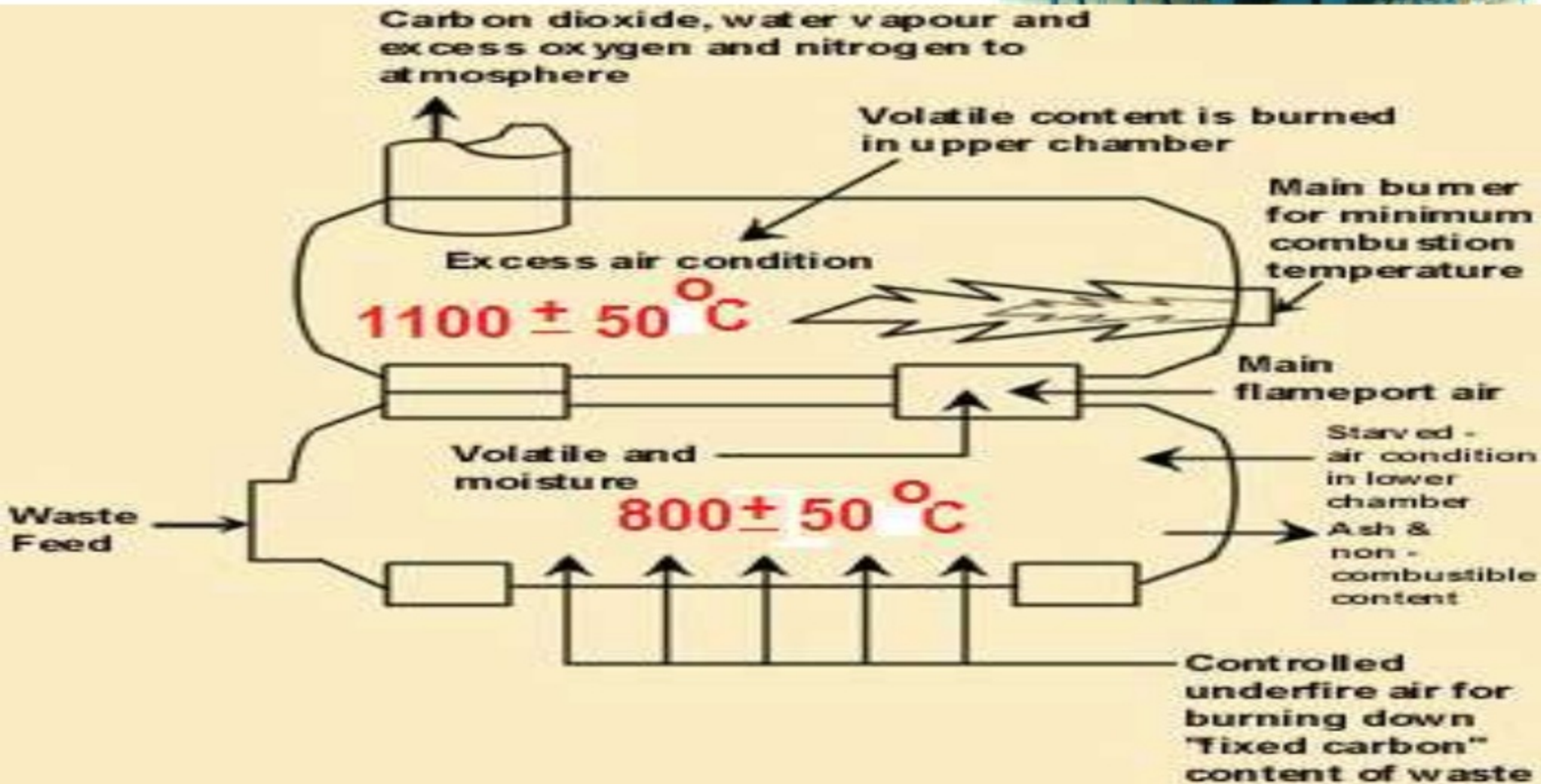
Note : Label shall be non-washable and prominently visible.

Transport

- Transport by wheeled trolleys/containers /carts only in vehicles authorized for the purpose
- They should be
 - Easy to load and unload
 - No sharp edges
 - Easy to clean
- Disinfect daily



Double Chambered Incinerator





Autoclave

- Temperature -not less than 121 °C
- Pressure -15 pounds per square inch (psi)
- Residence time - not less than 60 minutes



Micro wave

- kill bacteria and other pathogenic organism.
- not be used for cytotoxic, hazardous or radioactive wastes, contaminated animal carcasses, body parts and large metal items.

