

# **Division of Blood Transfusion Services**

**Ministry of Health and Family Welfare**



# Bio-Medical Waste Management



# Teaching Aims

You will learn about the categories of the bio medical waste,  
color coded bins and disposal of waste



# Biomedical Waste

Biomedical Waste means any waste, which is generated during diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals and including categories mentioned in Schedule I



# Bio-Medical Waste Management

- Improper disposal / treatment of un-segregated and segregated medical waste is a potential hazard affecting the health of the patients, health care workers, the community as well as the environment.
- A notification regarding Biomedical Waste (Management & Handling) Rules, 1998 has been published by the Ministry of Environment & Forests.



# Safe Disposal

- Segregation
- Disinfection
- Storage
- Disposal



# Categories of Bio-Medical Waste

Option	Waste category	Treatment & disposal
Category 1	<b>Human anatomical waste</b>	Incineration/deep burial
Category 2	<b>Animal anatomical waste</b>	Incineration/deep burial
Category 3	<b>Microbiology &amp; Biotechnology waste</b>	Local autoclaving/ microwaving/ Incineration
Category 4	<b>Waste sharps</b>	Disinfection (/autoclaving/ microwaving and mutilation/shredding
Category 5	<b>Discarded Medicines and Cytotoxic drugs</b>	Incineration/destruction and drugs disposal in secured landfills
Category 6	<b>Solid waste</b> (items contaminated with blood and body fluids)	Incineration autoclaving/microwaving

# Categories of Bio-Medical Waste *Contd...*

Option	Category of waste	Treatment
Category 7	<b>Solid waste</b> (Tubings, catheters, intravenous sets etc.)	Disinfection by chemical treatment autoclaving /microwaving and mutilation/ shredding
Category 8	<b>Liquid waste</b>	Disinfection by chemical treatment and discharge into drains
Category 9	<b>Incineration Ash</b>	Disposal in municipal landfill
Category 10	<b>Chemical waste</b>	Chemical treatment and discharge into drains for liquids and secured landfill for solids



# Colour Coding & Type of Container for Disposal of Bio-Medical Wastes

Color coding	Type of container	Waste category	Treatment options as per schedule I
Yellow	Plastic bag	Cat 1, Cat 2, Cat 3, Cat 6	Incineration/deep burial
Red	Disinfected container/plastic bag	Cat 3, Cat 6, Cat 7	Autoclaving/microwaving/ chemical treatment
Blue/white translucent	Plastic bag/puncture proof container	Cat 4, Cat 7	Autoclaving/microwaving chemical treatment and destruction/shredding
Black	Plastic bag	Cat 5 and Cat 9 and Cat 10 (Solid)	Disposal in secured landfill

# Color coded bins



# Blood bank Bio-medical waste management

Sl. No.	Area	Type of Waste generated	Segregation	Treatment of waste Disposal
1.	Donor Screening area	Swabs	Yellow Bags	Incineration
		Lancets	Puncture proof Container with Hypochlorite	Landfill/Safe pit
		Micro pipette tip	Red Bag	Shredder
		Gloves	Red Bag	Shredder
2.	Blood collection room	Swabs	Yellow Bag	Incineration
		Bag Needle	Needle destroyer (Puncture proof container)	Landfill/Safe pit
		Blood Bag tubing	Red Bag	Shredder
		Gloves	Red Bag	Shredder
		Wrappers(All Labs)	Black Bag	Municipal garbage
3.	Component lab	Blood bag tubing	Red Bag	Shredder
		Apheresis Kits	Red Bag	Shredder
		Gloves	Red Bag	Shredder

# Blood bank Bio-medical waste management

Sl. No.	Area	Type of Waste generated	Segregation	Treatment of waste Disposal
4.	TTI Lab	Sample tubes (Glass)	Hypochlorite solution	Recycle
		Sample tubes (Plastic)	Red Bag	Shredder
		Discarded plates	Red Bag	Shredder
		Washer waste	Hypochlorite solution	Drain in sewer line
		Chemicals reagents, kits Controls	Hypochlorite solution	Drain in sewer line
		Reactive Bags	Autoclave/Red Bag	Shredder
		Broken Sample tubes (Glass)	Hypochlorite solution	Land fill
		Gloves	Red bag	Shredder
5.	Serology Lab	Sample Vials (Glass)	Hypochlorite solution	Recycle/Land fill
		Blood Bag tubing	Red Bag	Shredder
		Test Tubes	Red Bag	

# Treatment and Disposal

Chemical treatment/autoclaving/microwaving



Mutilation / shredding

# Treatment and Disposal

Chemical treatment using 1% hypochlorite solution or any other equivalent chemical reagent should be used for ensuring disinfection.



# Treatment and Disposal

- Mutilation/shredding must be such so as to prevent unauthorized reuse.
- PVC shall not be incinerated.
- Liquid waste generated in cleaning, washing, house keeping and disinfection activities should be drained as ensuring chemical disinfection.



# Disinfection

- Reduction in the number of pathogenic microbes so that the material/object/surface becomes safe for handling
- Advantages of Na hypochlorite
  - Bactericidal
  - Virucidal
  - Easily available
  - Affordable
- Disadvantages
  - Corrodes metal
  - Deteriorates rapidly





# Cleaning of the glassware

- Slides, tubes and pipettes.
- Immerse in large volume of water to avoid drying of serum proteins.
- Immerse in mild detergent solution (e.g. Labolene) or chromic acid mixture for an hour or overnight.
- Wash thoroughly with running tap water.



# Cleaning of the glassware

- Rinse with distilled water.
- Drain off the water.
- Keep in wire basket with mouth downwards.
- Dry in hot air oven at 150<sup>0</sup>C.

# Blood and Blood Products in Plastic ware

– Blood bags → Autoclave → Disposal

- Tubings of bags
- Microtips
- Plastic vials
- Microplates
- Used blood bags



Immerse in 1% Na Hypochlorite  
for 30 minutes



**Mutilation/ Shredding**

# Safe Disposal of Sharps

- Dispose off your own sharps.
- Discard needles in puncture -proof rigid containers after disinfection in 0.5-1% fresh sodium hypochlorite solution.
- Don't dispose off in any other container.
- Dispose when container is 3/4 full.



# Autoclave

- Saturated steam under pressure is used to decontaminate infectious material.
- It consists of a insulated pressure chamber in which saturated steam is used to elevate the temperature
- A pressure of 15psi at 121°C for 30 minutes is required
- Adequacy of disinfection to be checked with strips of B. Stearothermophilus.



# Issues of Concern

- Regular sensitization
- Adequate resources
  - Regular availability of supportive items
- Monitoring mechanisms
  - Indicators





**To Health Care Workers and Community**



# Reference

Biomedical waste ( Management & Handling) rules 1998,  
Ministry of Environment and Forests.





# Learning Outcome

Enabled knowledge on the categories of waste, safe disposal of waste and the color coded bins

