

Healthcare waste management

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Outline of the Presentation

- Definition of Healthcare Waste
 - Sources and Generation of Healthcare Waste
 - Health and Environmental Impacts of hazardous waste
 - Hazardous Waste Regulations
 - Hazardous Waste Handling and Storage
 - Options for Safe and Scientific Management of Hazardous Wastes
- Occupational health and safety in Healthcare waste management

What is waste?

Any unwanted item in a given place at a given time can be

- Solid
- Liquid
- Gas (emissions)



Healthcare waste Definition

- Healthcare waste (HCW) is defined as the total waste stream from a healthcare facility (HCF)

- Two basic categories
 - Healthcare Non Risk Waste
75-90%

 - **Healthcare Risk/Hazardous Waste (HCRW)**
10-25%

Healthcare non risk waste

- Bio-degradable HCW
- Recyclable HCW
- Other HCW

What is hazardous waste?

General Definition :

Hazardous waste is a solid/semisolid/liquid waste which has a potential to cause an unacceptable risk to public health and environment because of its characteristics

A hazardous waste can have one or more of the following characteristics:



Ignitability



Corrosivity



Reactivity



Toxicity



Bio hazard

Healthcare Hazardous waste

- Infectious waste
- Sharps
- Pathological waste/Anatomical waste
- Chemical waste
- Radioactive waste
- Pharmaceutical waste
- Waste with heavy metals
- Genotoxic waste/Cytotoxic waste
- E-waste
- Bottom ash of incinerators
- Pressurized containers



- **Laboratory waste:**
 - ❖ Hazardous chemicals
 - ❖ Supernatants

- Sewerage

The Paradox: Hospitals Create Environmental Health Problems

- The UK national health service is responsible for 26% of public sector GHG emissions. Eight percent of US emissions are from healthcare. Ten percent of Brazil's energy is consumed by hospitals.
- The U.S. healthcare sector is the country's largest consumer of carcinogenic chemicals.
- Half the world's population is exposed to the negative health impacts of medical waste.

Extent of the problem of medical waste

“Over half of the world’s population are now at risk from occupational, environmental or public health threats from improperly treated medical waste.”



Harhay *et al.* (2009) *Tropical Medicine and International Health* 14(11): 1414-1417

Dioxins build up in the food chain

A survey of eggs near a small scale medical waste incinerator in India found dioxins at 5 and a half times the EU limit for food.

IPEN (2005) Contamination of chicken eggs near the Queen Mary's Hospital, Lucknow medical waste incinerator in Uttar Pradesh (India) by dioxins, PCBs and hexachlorobenzene

http://www.ipen.org/ipepweb1/library/ipep_pdf_reports/3ind%20lucknow_eggsreport.pdf



Can you have healthy people on a sick planet?



Right to a clean environment

- Dumped medical waste
- Waste burning and incineration
- Mercury pollution
- Pharmaceutical wastes
- Pathogens



Right to a clean environment



Right to a safe working environment

- **Medical staff**
- **Cleaners and hospital waste treatment staff**
- **Municipal waste workers**
- **Rag pickers**
- **Waste recyclers**
- **Workers in centralised healthcare waste treatment facilities**



Estimates of disease from NSI

Disease outcomes	Total number of cases	Percentage of cases	Estimating 20% associated with waste disposal		Estimated 10% during trash collection	
HIV	342,000	14%	68,400	2.8%	34,200	1.4%
Hepatitis B	15,000,000	25%	3,000,000	5.0%	1,500,000	2.5%
Hepatitis C	1,000,000	8%	200,000	1.6%	100,000	0.8%
Bacterial infections	3,000,000	7%	600,000	1.4%	300,000	0.7%
Injection site abscesses	850,000	Not reported	170,000	not known	85,000	not known
	Reid 2010		Gabriel 2009, Attaullah et al (2011)			

Right to life and health

- Serious lack of research on the effects of improper medical waste management
- Very little known about the impacts of exposure to chemicals, pharmaceuticals and radioactive waste
- Infections via various routes
 - Needle stick injuries
 - Inhalation of aerosols
 - Contaminated surfaces
 - ?Zoonotic transmission



We Need to keep the waste handling chain clean!



Responsibility

- **All health institutions are legally bound to manage hazardous healthcare waste.**
- Within the institution all categories of staff are responsible in assisting in waste management.
- The Head of the institution is responsible in ensuring establishment of proper waste management system within the institution, to minimize health and environmental impacts due to haphazard disposal of waste.

Cont.

- The local authorities are responsible only for managing general waste which is not hazardous.
- Authorities should ensure that general waste is not hazardous.
- A focal point for healthcare waste management should be appointed for the health institution
- A healthcare waste management committee for the health institution should be appointed
- Basic requirements include waste bins, waste carts, weighing scales, waste bags, waste storage, sewerage plant or septic pits

Waste Management Programme

The following basic steps to be followed in developing a proper waste management programme.

- Waste avoidance
- Waste minimization
- Segregation of waste
- Packaging
- Transportation
- Storage
- Treatment
- Disposal

1. Waste Segregation:

Waste has to be segregated at the source of generation, into different categories.

2. Waste Collection: Waste should be collected in bins/closed containers

3 Waste storage: waste should be stored in ventilated rooms locked and scavenging should be prevented.

4. Transportation: waste should be transported in closed trucks

5. Treatment & Disposal: Waste should be disposed in a sanitary manner.

National Colour Code on Solid Waste Management

Bio-Degradable



Glass



Plastic/Polythene



Paper



Metal



Bio-Degradable – Which decomposes easily – eg. Kitchen waste, garden waste

Glass – Glass bottles that can be recycled

Plastic – Polythene bags, plastic containers, pet bottles that can be recycled

Paper – Paper & cardboard

Metal – Empty cans

National Colour Code on Healthcare Waste Management

Yellow

- **Infectious waste**

Yellow with a red stripe

- **Sharps**

Black

- **General waste**

Orange

- **Clean plastic & polythene**

Blue -

- **Clean paper & cardboard**

Green

- **Bio-degradable waste**

Red

- **Glass**

Brown

- **Metal**

Purple

- **Cytotoxic**

E-waste

- **Grey**

Pharmaceutical waste

- **White**

Segregation of healthcare waste



Waste storage



Waste Storage



▣ Castle Street Hospital

Waste carts



Incinerators





Function of the head of the institution

- Form a health care waste management committee (HCWMC)
- Develop a written waste management plan for the HCF.
- Appoint a focal point for healthcare waste management to supervise and coordinate the waste management plan.
- Ensure monitoring of the plan
- Ensure adequate training for the key staff members and designate the staff responsible for coordinating and implementing the training course.
- Establish good working relationship with related organizations concerning HCWM.
- Establish good community relationship through the awareness raising activities to the community people.

Health care waste management committee (HCWMC)

- The committee should constitute at least following members:
 - Director/Head of the HCF
 - Microbiologist, Consultant, Medical Officer,
 - Matron, ICNO
 - Accountant, Administrative Officer
 - Public Health Inspector
 - Overseer
- For other smaller HCF
 - Head of the HCF
 - Technical staff
 - Support staff (Junior Health Staff)

Functions of the waste management committee

- Establish baseline data and develop the HCWM plan which must include, training and written guidelines on waste management from waste generation to waste treatment and final disposal.
- Implement the HCWM plan and review and update the plans and guidelines in an annual basis.
- Ensure adequate financial and human resources for the implementation of HCWM plan
- Assign responsibility to each member of the committee.

Monitoring and evaluation

- Baseline monitoring
- Compliance monitoring
- Impact monitoring

Legislation

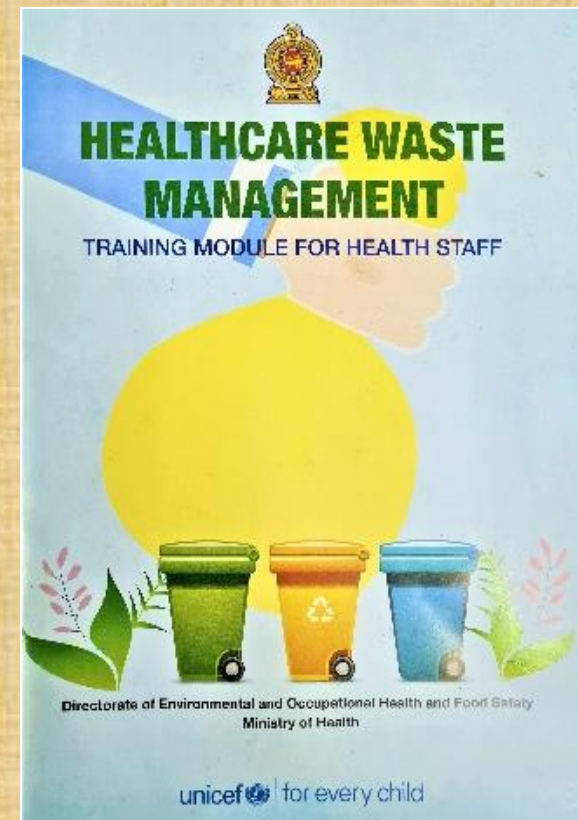
National Environmental Act
EPL and SWML

Divisional and above hospitals - EPL + SWML

PMCU and MOH offices - SWML

Other requirements

- Regular monitoring
- Community engagement
- Capacity building of health staff
- Occupational health and safety



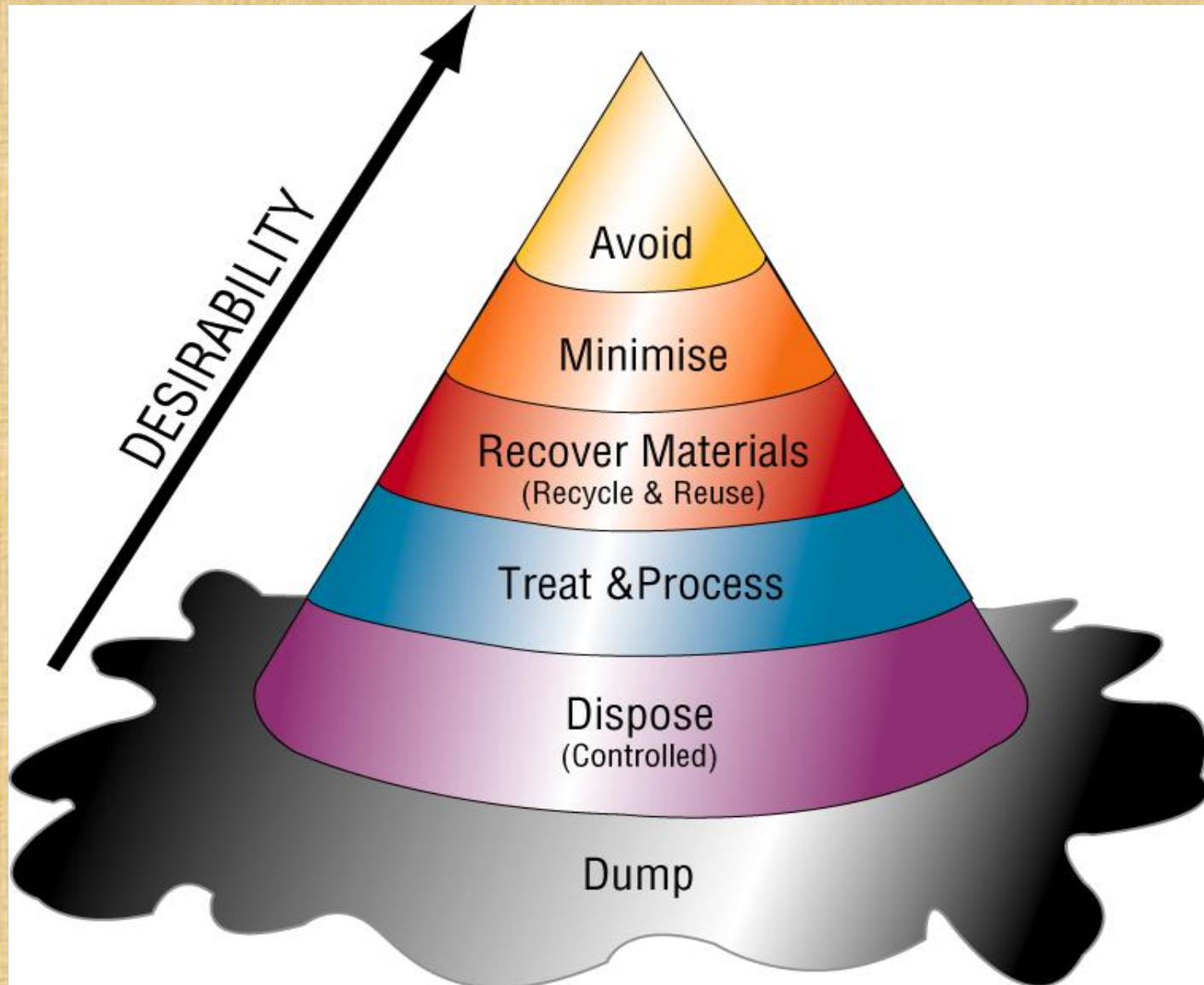
Worker protection

Basic requirement:

- **Hard gloves**
- **Overalls/aprons**
- **Covered shoes**



Waste Management hierarchy



THANK YOU