MODULE 05

Behavioural Change and Health Hazards

The presentation will focus on:

i) Driving sustainable waste management practices through behavioural change

ii) Promoting behavioural change in healthcare workers

iii) Strengthening database in waste

iv) Environmental and Health issues

This session will focus on adopting behavioural change practices through behavioural insights on BMWM.

5.1 Driving sustainable waste management practices through behavioural change

Healthcare facilities are essential institutions in any society, and their operations generate a significant amount of bio-medical waste. Improper management of biomedical waste poses a risk to public health and the environment. Healthcare facilities in India have not been exempted from the challenge of managing bio-medical waste effectively. The management of bio-medical waste requires a behavioural change in healthcare workers and other stakeholders in the healthcare setting. This module focuses on the behavioural change required to ensure proper bio-medical waste management in healthcare facilities.

5.2 Promoting behavioural change in healthcare workers

Proper and safe bio-medical waste management at a healthcare facility is crucial since it constitutes biohazardous, general and other kinds of waste generated through day-to-day activities. Healthcare workers play a critical role in the proper management of bio-medical waste. The success of any bio-medical waste management programme in a healthcare facility depends on the participation of the healthcare workers. The behavioural change required among healthcare workers includes proper waste segregation at the source, proper interim storage of waste and following precautionary measures for transportation, treatment, and disposal. It also includes bringing a positive mindset change in implementing and following the guidelines set for the different methods of bio-medical waste management.

Following mechanisms can be strengthened through:

- Healthcare workers should be adequately trained periodically to strictly follow guidelines set forth by the CPCB and adopt best practices of bio-medical waste management.
- The example should be set from the top to the bottom, the in-charge of the facility and the doctors and nurses should adopt the practice first. The same should be communicated to the waste handlers managing the waste on daily basis.

5.2.1 Behavioural change in patients and visitors

Patients and visitors to healthcare facilities also play a crucial role in the management of bio-medical waste. The behavioural change required among patients and visitors includes proper disposal of bio-medical waste and reporting any incidences of improper bio-medical waste management. Patients and visitors should be educated on the colour codes used for the segregation of bio-medical waste as well as general waste. Patients and visitors should dispose of bio-medical waste in designated containers to prevent contamination of the environment. Healthcare facilities should have mechanisms for reporting such incidences to a committee monitoring bio-medical within the facility. Patients and visitors should be educated on the importance of reporting any incidences of improper biomedical waste management through proper IEC materials, such as posters and banners in the facility, with the contact details of the person to whom it should be reported.

5.2.2 The role of management in behavioural change

The management should provide the necessary resources for the proper management of bio-medical waste. The resources required include personnel protective equipment and materials along with proper designated areas of collection, segregation, interim storage, intra mural transportation and disposal of bio-medical waste.

5.3 Strengthening database in waste

For monitoring, determining priority intervention areas, building locally relevant waste management solutions, and planning operational ground-level aspects like vehicle count, route management, waste collection tracking, etc, data on waste generation, both individual and, aggregated is essential. Using this data, IEC activities can be planned to raise awareness and sensibility of the public. A potent strategy for

encouraging people to adopt socially desirable behaviours is information that highlights examples of desirable behaviour in a positive light. Hence it is recommended that:

- ICT tools should be adopted for data reporting, including red-flagging unreliable data sets.
- Capacity of stakeholders involved, such as HCF staffs, CBWTF staffs, etc. for data collection should be augmented with the help of focused training modules for concerned staff. Data collection shall improve if subordinate staff perceives data as a tool that eases operations, and not just as a tool for chastisement.
- Available data should be used for periodic review by senior officials, and as a decision support tool. This shall help prioritise quality data collection amongst subordinate staff.
- Independent agencies should be engaged for data validation in order to improve data reliability.

5.4 Environmental and health issues

The major concern with waste generated from hospitals is that it is infectious in nature and poses serious concern of cross-contamination unless managed properly. Typically, 15–20% of the total waste generated in a hospital is infectious. If not handled properly, it can contaminate the rest as well.

Besides this, several other reasons which make hospital waste an issue of concern include:

- **Spread of infection:** Waste generated from hospitals is a mixture of infectious pathogens (containing bacteria and viruses) and kitchen or organic waste. If the two are not segregated at source, the organic waste provides a fertile environment for pathogens to multiply.
- **Improper disposal of sharp equipment which might cause grievous injury:** Sharp equipment like hypodermic needles, scalpels, broken glass, ampoules, blades, knives etc. can cause injuries as well as infection by puncturing or cutting skin.
- **Leakage of cytotoxic drugs:** These drugs are used for the treatment of cancers. Some of these drugs are carcinogens. They may even cause birth defects (terratogenic) and miscarriages, as well as chromosomal damage (mutagenic). Therefore, the disposal of drugs and any items contaminated with such drugs demands serious attention.
- **Dispersal of harmful chemicals:** A wide variety of chemicals are used in hospitals during processes such as treatment diagnosis, laboratory sample preservation, cleaning and housekeeping, disinfection procedures etc. These chemicals include glutaraldehyde, formaldehyde, sodium hypochlorite, phenyl etc. They can cause irritation and damage to the eyes and skin, headaches and nausea.
- **Occupational hazard:** Occupational hazard is another issue associated with improper waste management in a healthcare facility. This can be caused by unsafe injection and hazardous chemical use and disposal.
- **Patient Safety** -
- Hazards such as needle stick injury (NSI), healthcare associated infection (HAI) and anti-microbial resistance (AMR) are some of the most common occupational hazards from which the healthcare facility staff needs to be careful.

1. **(Needle stick injury):** Needle stick injury is a serious occupational hazard in biomedical waste management, posing a risk to healthcare workers who handle and dispose of used needles and other sharps. Needle stick injuries can result in exposure to bloodborne pathogens such as hepatitis B, hepatitis C, and HIV, leading to potential transmission of these infections to healthcare workers.
2. **(Antimicrobial resistance):** Antimicrobial resistance happens when germs like bacteria and fungi develop the ability to defeat the drugs designed to kill them. Exposure to germs Resistant infections can be difficult, and sometimes impossible, to treat. Antimicrobial resistance is a naturally occurring process. However, increases in antimicrobial resistance are driven by a combination of germs exposed to antibiotics and antifungals, and the spread of those germs and their resistance mechanisms.

- **Unsafe recycling of syringes:** Syringes disposed of carelessly end up being picked up by scavengers and reused illegally. They can spread a wide variety of infections, including Hepatitis B&C and HIV.

  The term 'safe injection practices' refers to the combination of three approaches: safe administering of injections to the patient, no incidence of needle stick injuries (NSI) to the staff administering the injection and, finally, safe and environmentally-sound disposal of used syringes and needles. Studies by the WHO have concluded that Hepatitis B virus can survive in a syringe even in dry blood conditions for seven–eight days. Therefore, it is important to properly dispose of used syringes and needles.
- **Uncontrolled burning and emission of dioxin and furans:** Uncontrolled burning of all kinds of waste, including chlorinated plastics, leads to the emission of dioxins and furans into the atmosphere, which are classified as carcinogenic in the Stockholm Convention on Persistent Organic Pollutants (POPs) to which India is a signatory. Therefore, preventing such emissions is both an environmental as well as legal requirement. If segregation of waste at source can be ensured, it will help in avoiding plastics and other toxic materials going for incineration.

Table 6: Impact from different kind of wastes

Sl. No.	Type of Waste	Hazard from the Waste
1	Infectious waste and sharps	• Cuts • Abrasions • Infections
2	Chemical and pharmaceutical waste	• Intoxication by acute or chronic exposure • Physical injury • Chemical burns • Injury to skin • Injury to eye • Injury to mucous membrane of airways • Respiratory disease • Skin disease
3	Genotoxic waste	• Irritant • Dizziness • Nausea • Headache • Dermatitis
4	Radioactive waste	• Headache • Dizziness • Vomiting • Fatal
5	Healthcare waste-treatment methods	• Flue gases from improperly functioning waste incinerators • Physical injuries • Leachate release into water • Burning leads to heavy metal release
6	Public sensitivity	• Sensitivity to vision of anatomical parts

Figure 16: Hazards of BMW