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THE PEOPLE'S UNIVERSITY
Indira Gandhi National Open University
School of Health Sciences

in collaboration with

World Health Organization
REGIONAL OFFICE FOR South-East Asia

BHME-106
ADMINISTRATIVE AND LEGAL ASPECTS OF WASTE MANAGEMENT

"Education is a liberating force, and in our age it is also a democratising force, cutting across the barriers of caste and class, smoothing out inequalities imposed by birth and other circumstances."

—Indira Gandhi

''शिक्षा मानव को बन्धनों से मुक्त करती है और आज के युग में तो यह लोकतंत्र की भावना का आधार भी है। जन्म तथा अन्य कारणों से उत्पन्न जाति एवं वर्गगत विषमताओं को दूर करते हुए मनुष्य को इन सबसे ऊपर उठाती है।''

–इन्दिरा गांधी

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Administrative and Legal Aspects of Waste Management

Block

1

ADMINISTRATIVE AND LEGAL ASPECTS OF WASTE MANAGEMENT

UNIT 1

Administrative Aspects of Health Care Waste Management **5**

UNIT 2

Legal Aspects of Health Care Waste Management **47**

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COURSE INTRODUCTION

You have already learnt about the basic concepts in units covered in BHM-101 and 102 module. You are now in a better position to understand and implement sound health care waste management systems in your health care facility. This course deals with the administrative and legal aspects of the health care waste management and has been written mainly from the perspectives of the Bio-Medical Waste Management Rules, 2016, and the Bio-Medical Waste Management (amendment) Rules, 2018, Government of India.

It is a must for all those who would like to understand, improve and put in place the system of management of waste in their locations and at the same time comply with the existing rules. It is suggested that you read the Block 4 of Course BHM 101 and the Block 1 of Course BHM-102 before you venture this course.

This block comprises of two units each covering administrative and legal aspects of health care waste management respectively.

Unit 1 deals with the administrative aspects of health care waste management**.** Itguides you regarding procedure for conducting waste audit. It also acquaints you with the role, composition and functions of infection control and health care waste management committee. The unit also covers the importance and procedure to conduct monitoring and evaluation of the existing HCWM systems. Importance, contents and modalities of training has been covered in details. Basic cost considerations in setting up health care waste management system is briefly explained. An overview of the list of records and reporting of essential events has been placed for your information.

Unit 2 deals with the legal aspects of health care waste management**.** In this unit, regulatory principles, International conventions and National convention with respect to India have been briefly covered. As an occupier, you are required to be come familiar with various legal aspects such as authorisation, reporting, how to appeal. Also has been elaborately covered regarding how, when, what and whom to report with respect to the management of health care waste. Penalties for violations have been explained quoting some case studies. FAQs have been provided which will help you understand the integrities more easily.

UNIT 1 ADMINISTRATIVE ASPECTS OF HEALTH CARE WASTE MANAGEMENT

Structure

1.0 Objectives

1.1 Introduction

1.2 Establishing Health Care Waste Management Systems

1.3 Basic Components of a Health Care Waste Management System

1.4 Waste Audit
- 1.4.1 Tools for Waste Audit
- 1.4.2 Outcome of a Waste Audit

1.5 Role of the Hospital Infection Control Committee
- 1.5.1 Main Functions of the Hospital Infection Control Committee (HICC)
- 1.5.2 Hospital Infection Control Team (HICT)

1.6 Role of the Health Care Waste Management Committee
- 1.6.1 Composition of a Bio-Medical Waste Management Committee (BMWMC)
- 1.6.2 Responsibilities of the Bio-Medical Waste Management Committee

1.7 Roles of Personnel Involved in Waste Management

1.8 Policies, Guidelines and Standard Operating Procedures for HCF

1.9 Monitoring

1.10 Evaluation

1.11 Documentation and Record Maintenance

1.12 Cost Considerations to Set up HCWM Systems in a HCF

1.13 Purchase Policy for Health Care Waste Management Systems

1.14 Training

1.15 Let Us Sum Up

1.16 Glossary

1.17 Answers to Check Your Progress

1.18 References and Further Readings

Annexure-1 Action Plan
Annexure-2 Daily Monitoring Checklist
Annexure-3 Monthly Monitoring Checklist
Annexure-4 Technical Specification for Containers and Bags

1.0 OBJECTIVES

After studying this unit, you should be able to :

- discuss the role of administrators in establishing sound health care waste management (HCWM)

- outline the roles and responsibilities of the various personnel
- explain the role of waste audit
- discuss the policies, guidelines and Standard Operating Procedures (SOPs) and their importance
- describe the role and scope of the Infection Control Committee and Health Care Waste Management Committee
- describe the need for monitoring and mechanisms for conducting monitoring HCWM systems
- explain the steps in conduct of evaluation of health care waste management (HCWM) systems
- discuss the cost considerations for HCWM
- discuss the training on HCWM – importance, contents and methodology

Think and reflect

Administrators have not only moral responsibility but also have a legal responsibility of managing health care waste in a scientific manner. You may like to agree or differ. Justify your answer.

1.1 INTRODUCTION

Administrator of a health care facility has mammoth responsibility in establishing sound health care waste management systems in his/ her health care facility. It is not only the moral responsibility but also the legal responsibility of the administrator to ensure that the generated health care waste is managed in a manner such that it does not harm human health or environment.

In this unit, you will learn about the role of administrators in establishing sound health care waste management systems, their requirements, policies and Standard operative procedures, cost considerations etc. You will also be familiarised with the importance, process and tools for monitoring and also evaluation that needs to be in built in health care waste management systems so that the efforts need to be sustained and maintained. You may adopt the tools discussed in this unit as suitable to your institution for monitoring the systems.

Did you know?

We are talking about the Administrative aspects of health care waste management in general, however at places the concepts have been explained giving the example of the Bio-Medical Waste Management Rules, 2016, as amended Govt of India. Please remember that the guidelines and procedures for the different aspects covered must be followed as per the specific legislation/ guidelines of the respective countries.

1.2 ESTABLISHING HEALTH CARE WASTE MANAGEMENT SYSTEMS

Health Care Facilities (HCFs) may be called as "systems" and is composed of interacting and interdependent parts called "sub-systems". Management of Health Care Waste in any facility is one such sub-system which again has many interacting and interdependent activities like proper handling, storage, transportation, pre-treatment and disposal of waste in an environmentally sound manner. HCFs should set up a comprehensive waste management system which is 'safe, sound and environment friendly'. Waste management system in a health care setting should start with basic measures and then gradually improve on Incremental basis. Human element is more important than the technology in management of health care management.

Did you know ?

A health care facility is a system and health care waste management is a sub-system.

A well-motivated and well-trained health care staff would manage health care waste better when compared to health care staff who is provided with sophisticated technology but who does not understand the risks of improper management of health care waste.

1.3 BASIC COMPONENTS OF A HEALTH CARE WASTE MANAGEMENT SYSTEM

Basic components of health care waste management (HCWM) that any health care facility should follow are mentioned in **Box 1.1**.

a. Compiling inventory of waste
b. Assignment of responsibility for waste management
c. Allocation of sufficient human and financial resources
d. Practicing waste minimisation, including purchasing policies and stock management practices
e. Identification of sources of generation of waste
f. Segregation of waste at source
g. Collection of waste
h. Pre-treatment of waste at source
i. Intra-mural transportation of waste
j. Temporary waste storage area
k. On-site waste treatment and disposal (in some countries like India, this is adopted only where no Common Bio-Medical Waste Treatment Facility (CBMWTF) exists within 75 km distance)
l. Off- site transportation of waste through a CBMWTF
m. Final treatment and disposal through a nearby CBMWTF located within 75 kms (in India as per BMWM Rules, 2016 as amended)
n. Occupational safety
o. Cleaning and disinfection of waste equipment
p. Spillage control
q. Accident and incident reporting and evaluation of annual occurrences
r. Record maintenance relating to waste generation, transportation, pre-treatment, waste disposed through a Central Treatment Facility (CTF), occupational safety issues of Health Care workers, submission of annual reports, effluent characteristics, monitoring results with respect to the air emission sources, training records
s. Monitoring and evaluation
t. Periodic Training of all personnel in health care facility – doctors, nurses, paramedical staff and waste handlers.
u. Awareness raising of patients, visitors and the public

Box 1.1: Basic components of health care waste management system

All these components have been covered to some extent in the previous units of the compulsory courses. In this unit, Waste audit, Roles and Responsibilities, Monitoring, Evaluation, Cost consideration, Training, Record maintenance shall be discussed in details.

Check Your Progress 1

1. List out any five basic components of establishing sound management of health care waste.

.....

.....

.....

.....

Question

What is waste audit?

Answer

Waste audit is analysis of the waste stream management in your facility.

1.4 WASTE AUDIT

Waste Audit is one of the initial step that needs to be undertaken to plan a health care waste management system in a health care facility. **Fig. 1.1** shows how waste audit helps in planning health care waste management system.

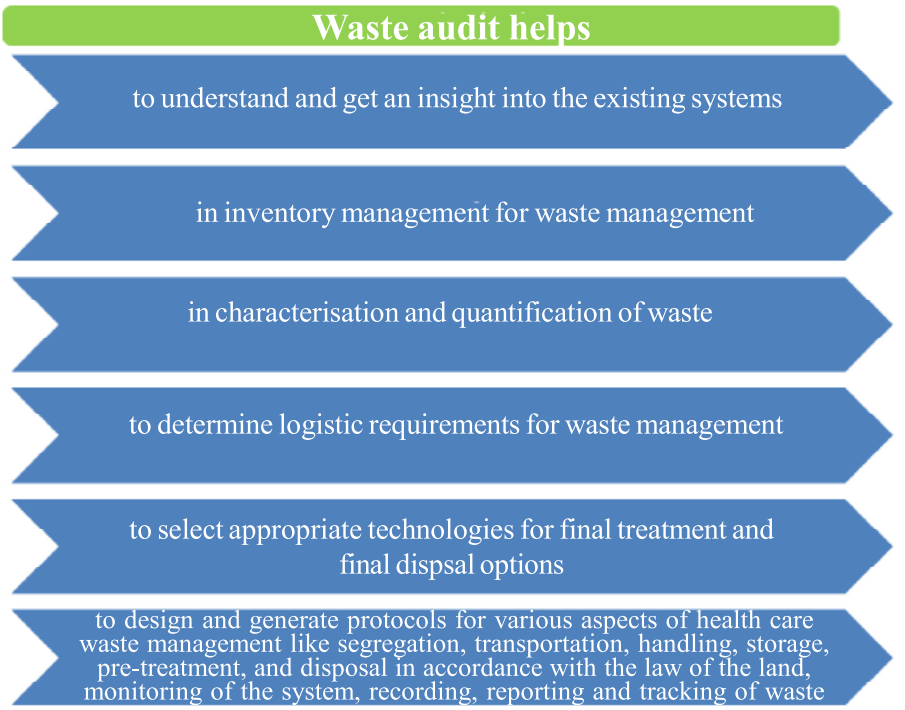

Fig.1.1 : Waste audit helps planning of health care waste management

The waste audit exercise helps to review the following aspects as mentioned in **Fig 1.2**.

Fig 1.2: Waste audit exercise

Three stage process of waste audit is mentioned in **Fig. 1.3**.

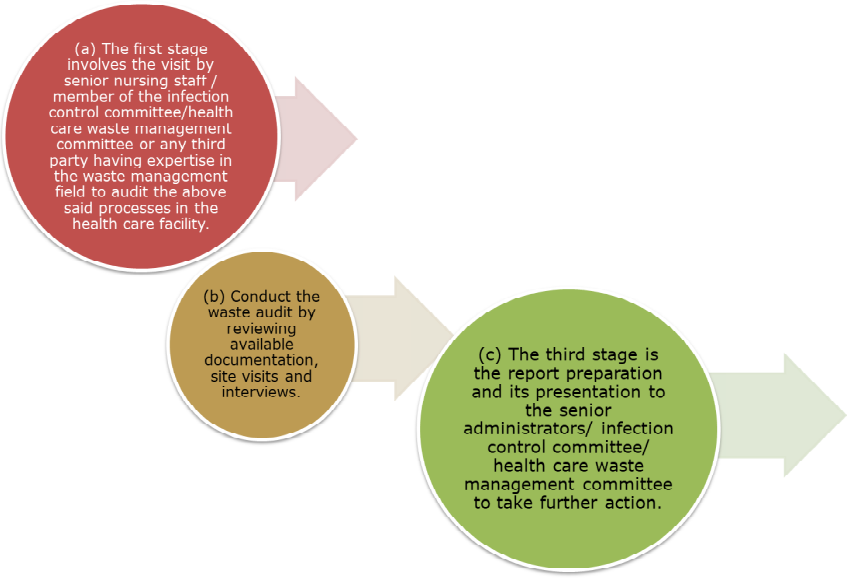

Fig. 1.3: Three stage process of waste audit

1.4.1 Tools for Waste Audit

The survey questionnaire for conducting waste audit can be adopted from WHO website i.e .,

http://www.who.int/water_sanitation_health/medicalwaste/034to057.pdf

http://www.who.int/water_sanitation_health/medical waste/034to057.pdf

1.4.2 Outcome of a Waste Audit

1. Inventory of waste generation sources, quantum of category-wise waste generation and other related aspects. Inventory also helps to comply with national legal requirements like in India the BMWM Rules, 2016 as amended which have been enumerated in the **Box 1.2**.

a. Type of waste colour coded bags or container required for waste segregation at source

b. Provisions required for trolleys for handling of waste from source of generation to the temporary waste storage area

c. Temporary waste storage area requirement and the necessary provisions

d. Final waste disposal options available in the HCF vicinity

e. Wastewater generation and its characteristics and system required for its treatment to comply with the effluent discharge norms before its disposal, possibility of utilisation of treated water as a measure of reduction of water consumption

f. Sources of air emissions and measures required for control of air emissions, monitoring requirement to comply with the conditions of consents or authorisation granted by the respective State Pollution Control Board (SPCB) or Pollution Control Committee (PCC)

Box 1.2: Advantages of Waste Audit for compliance to the BMWM Rules, 2016, as amended

2. Preparation of action plan to develop and evolve a system in place. A sample action plan is annexed as **Annexure-1**.

3. Laying down health care waste management systems – segregation at the source of generation, collection procedures, transportation to be followed, storage, pre-treatment, treatment requirement and selection of final disposal mechanisms.

Check Your Progrees 2

1. What is waste audit?

   .....

   .....

2. List any two outcomes of waste audit.

   .....

   .....

1.5 ROLE OF THE HOSPITAL INFECTION CONTROL COMMITTEE

Infection control in any health care facility is critical to reduce healthcare associated infections. 'Healthcare Associated Infection'(HAI) are those infections that are neither present nor incubating at the time of the patient's admission to health care facility. Infection control includes the prevention and management of HAIs through the application of research based knowledge to practices and it includes:

a. standard precautions
b. decontamination
c. waste management
d. surveillance and
e. audit

One of the key component of infection control is safe management of health care waste as well. The key to control hospital infections is to constitute Hospital Infection Control Committee (HICC) which can also functions at the policy making level for hospital infection surveillance and control programme. The members vary based on the size and kind of health care facility and composition of the HICC is given in **Fig .1.4**.

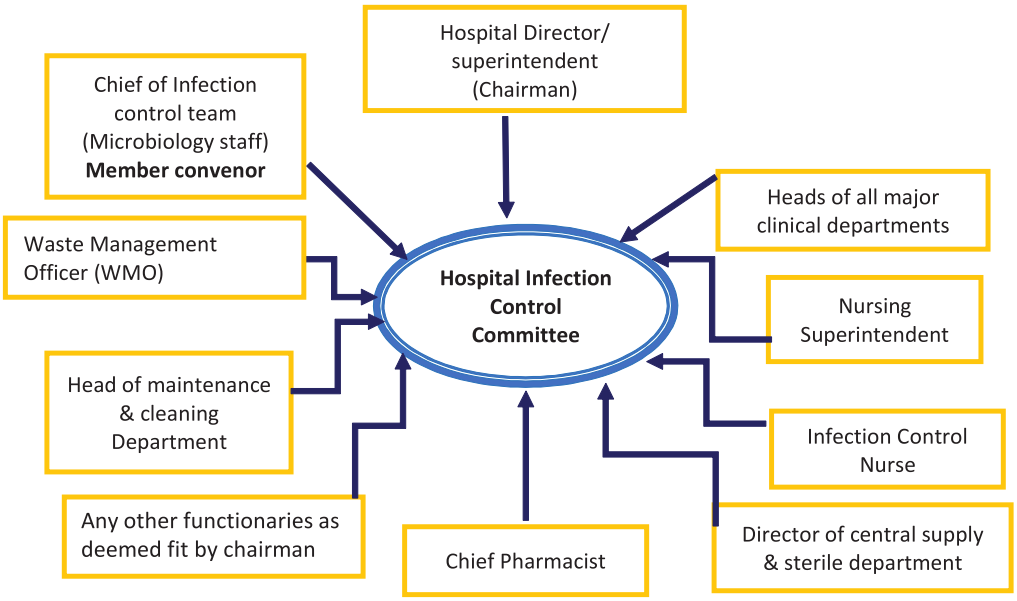

Fig. 1.4: Composition of Hospital Infection Control Committee

1.5.1 Main Functions of the Hospital Infection Control Committee (HICC)

Main functions of the HICC is mentioned in **Box 1.3**.

a.	Development and implementation of infection control policies
b.	Supervision of standards of professional care in regards to infection
c.	Education and orientation programme for professional staff
d.	Surveillance of hospital acquired infections
e.	Occupational health surveillance
f.	Standards of hospital domestic cleaning and food services hygiene
g.	Management of visitors in isolation circumstances
h.	Matters of general hospital organisation and purchasing where these may affect infection control
i.	Establishment and supervision of infection control team
j.	Health care waste management
k.	Submit an activity report and statistical data to the central committee every 6 months

Box 1.3: Main functions of the Hospital Infection Control Committee

1.5.2 Hospital Infection Control Team (HICT)

To effectively implement and monitor the activities of infection control, Infection control team which works on ground should be constituted. The team consists of Microbiologist (Infection control officer), Senior Resident (Infection Control member) and Infection Control Nurses. The main functions of the ICT are mentioned in **Box 1.4**.

a.	Identify and conduct root cause analysis of hospital acquired infections
b.	Investigation of environmental problems related to hospital infections
c.	Detect community acquired infections in the hospital and refer them to the appropriate authority for follow-up.
d.	Prompt initiation by physicians based on hospital infection report
e.	Take-up necessary follow-up measures of "Nosocomial infections" cases after discharge including periodic laboratory monitoring
f.	Assist in the development and review of infection control procedures to be forwarded to the central committee annually
g.	Monitoring of hospital policy compliance on isolation procedures
h.	Development and implementation of employees in service orientation programme related to infection control
i.	Monitoring the effectiveness of infection control programme
j.	Organising occupational health programme
k.	Monitoring of health care waste management practices
l.	Guiding and monitoring of hospital infection control through the housekeeping agency, catering agency, water supply department and other environmental agencies

Box 1.4: Main functions of the Infection Control Team (ICT)

a. Functions of the hospital infection control officer

The main functions of a hospital infection control officer (ICO) are mentioned in **Box 1.5**.

a. Supervise the nursing officers in matters of health care waste management
b. Liaise with the chairman of Infection control committee and microbiology technician
c. Must be able to make day to day decisions on infection control within the guidelines of the infection control manual
d. Draw up the duties of staff nurse/nursing officers regarding infection control activities
e. Provide continual up-to-date patterns of antibiotic resistance to the microbiology technician
f. Have detailed knowledge of the infection control policies in the hospital

Box 1.5: Main function of a hospital Infection Control Officer (ICO)

b. Functions of the hospital infection control nurse

The main functions of the hospital infection control nurse (ICN) are mentioned in **Box 1.6**.

a. Checking wards and clinics to detect and record hospital acquired infections
b. Investigation of hospital based infection to determine if inadequate procedures may have contributed
c. In conjunction with the technical officer, to pursue apparent incidents of cross infection
d. Surveillance of isolation procedures
e. Surveillance of nursing practices where they are related to infection, e.g., sterile techniques
f. Monitoring of food hygiene and health of food handling staff
g. Monitoring collection and disposal of infected wastes
h. Conduct education programmes in infection control for all new nursing and paramedical staff, in conjunction with the medical and technical officers
i. Preparation of infection control statistics for infection control committee

Box 1.6: Main functions of the hospital infection control nurse (ICN)

Check Your Progress 3

Unscramble the words which describe the functions of HICC

1. CLUENALVRSIE
2. GOTMINRINO
3. TOIPSLAH RIDEUQCA TEINICOFNS
4. COLSEPII

.....

.....

1.6 ROLE OF THE HEALTH CARE WASTE MANAGEMENT COMMITTEE

Most institutions must have a committee that looks after the management of the health care waste. The type of waste that this committee looks after can vary depending upon the legislation or guidelines of the respective country. **We shall take the example of India, wherein the BMWM Rules, 2016, as amended are to be complied with**. This Bio-Medical Waste Management Rules, 2016 as amended stipulates that every occupier should "establish a system to review and monitor the activities related to bio-medical waste management, either through an existing committee or by forming a new committee and the Committee shall meet once in every six months and the record of the minutes of the meetings of this committee shall be submitted along with the annual report to the prescribed authority and the health care establishments having less than thirty beds shall designate a qualified person to review and monitor the activities relating to bio-medical waste management within that establishment and submit the annual report".

Accordingly, it is mandatory to establish a 'bio-medical waste management committee' by all the health care facilities where number of beds is more than 30. In a smaller health care facility (with number of beds less than 30), a nodal officer needs to be identified and designated to oversee the activities of bio-medical waste management. Bio-medical waste management committee can be constituted separately or could be a part of infection control committee whichever is feasible and appropriate for that health care setting.

In large hospitals it is preferred to establish a dedicated committee for bio-medical waste management, which will have main functions of implementing waste management in an environmentally sound and safe manner. In such situations, infection control committee should coordinate with the waste management committee to align health care management practices and policy in line with the infection control policy.

1.6.1 Composition of a Bio-Medical Waste Management Committee

The Medical Superintendent/Director of Health Care Facility shall constitute a Waste Management Committee comprising following Members, as given in **Fig.1.5**.

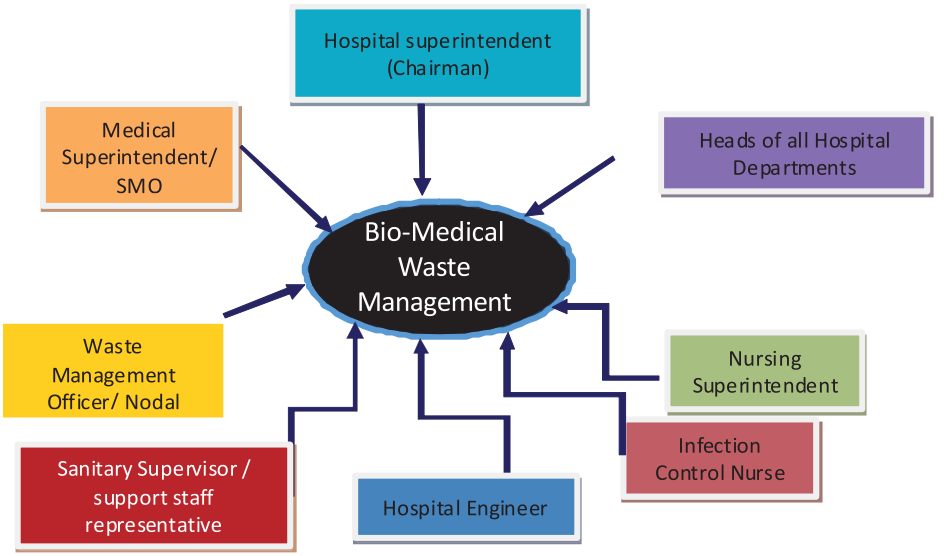

Fig.1.5: Composition of the Bio-Medical Waste Management Committee

1.6.2 Responsibilities of the Bio-Medical Waste Management Committee

The bio-medical waste management committee shall be responsible for the following functions as mentioned in **Box 1.7**.

a. The preparation of policies or guidelines and Safety Operation Procedures (SOPs) for waste management in line with the prevailing rules notified under national regulations (In India it is the Environment (Protection) Act, 1986)
b. Monitoring, periodic review, revision or updating if necessary
c. Implementation of health care waste management policies and procedures
d. Documentation of waste quantum, evaluation of data and presentation
e. Any other functionaries as deemed fit can be included or called for as and when required by the chairman of the committee

Box 1.7: Responsibilities of bio-medical waste management committee

In order to meet the above requirements, the committee shall meet regularly to review situation; develop or review hospital management policy/guidelines, involve in regular monitoring and supervision, identify problems and develop action plan to solve problems, allocate resources for waste management.

Check Your Progress 4

1. Which of the following is not the role of health care waste management committee?
   a. Preparation of policies or guidelines for health care waste management
   b. Monitoring of health care waste management
   c. Surveillance of hospital acquired infections
   d. Hospital Implementation of HCWM policies and procedures
2. According to Bio-Medical Waste Management Rules, 2016, all HCFs having more than ____ no. of beds need to have bio-medical waste management committee

1.7 ROLES OF PERSONNEL INVOLVED IN WASTE MANAGEMENT

Safe and sound management of health care waste largely depends on good administration and organisation with active participation of all staff who should be trained and well informed.

Typical waste management structure for a HCF is given in **Fig.1.6**.

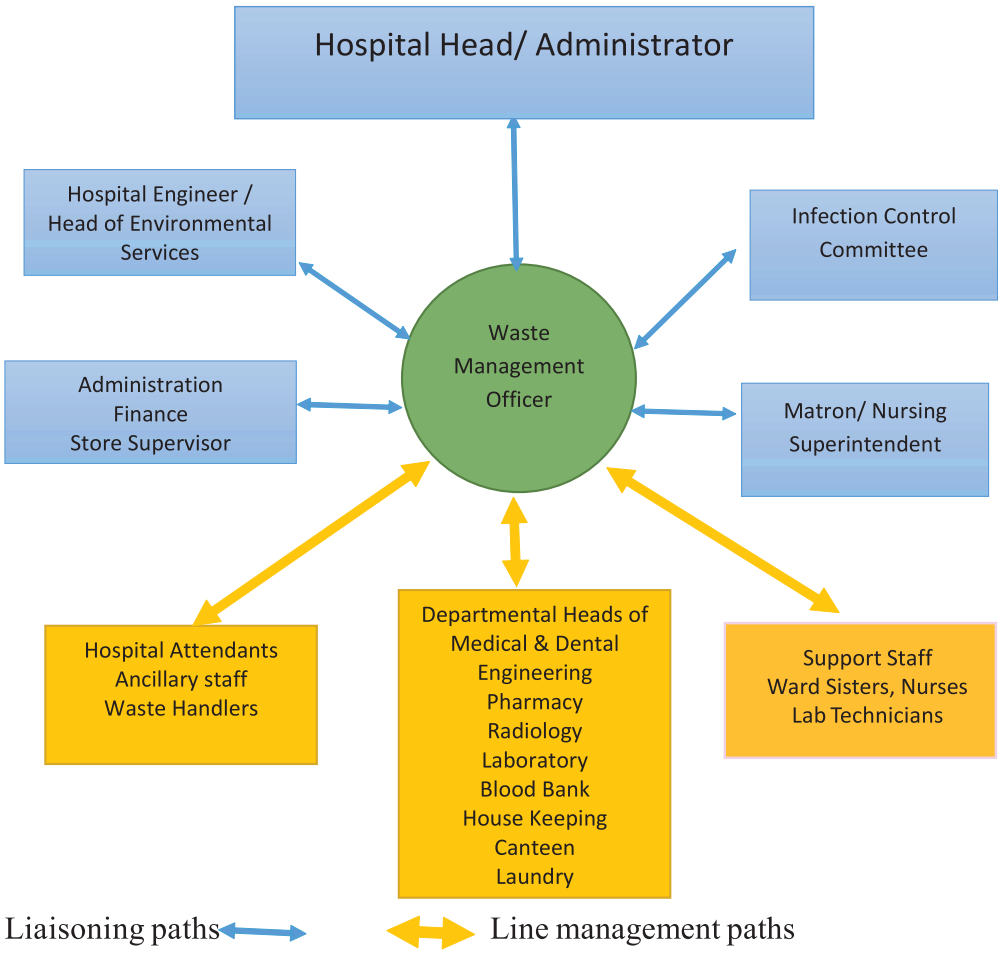

Fig.1.6: Typical Waste Management Committee

Adapted and modified from source: **http://www.who.int/water_sanitation_health/healthcare_waste/module24.pdf**

Source:
http://www.who.int/water_sanitation_health/healthcare_waste/module24.pdf

The duties of the key personnel involved in waste management is described below; in smaller health care facilities, one person may fulfil two or more sets of responsibilities.

a. Head of hospital

The head of hospital is responsible for the following tasks as mentioned in **Box 1.8**.

The head of hospital is responsible for the following tasks:

a. Ensure obtaining required approvals as required under the rules/acts notified by the different ministries or state government

b. Form a waste-management team to develop a written waste-management plan for the hospital. The team should consist of representatives from clinical and non-clinical areas of the organisation, in addition to those who are involved in the direct handling and removal of waste. The duties and responsibilities of all members should be clearly delineated with respect to handling of health care waste and lines of accountability to be established

c. Designate a waste-management officer to supervise and implement the waste-management plan

d. Allocate sufficient financial and personnel resources for executing waste management plan

e. Ensure that monitoring procedures are incorporated in the plan

f. Ensure adequate training for staff members, and designate the staff responsible for coordinating and implementing training courses

g. Ensure proper record maintenance and its reporting within the due date to the regulatory authorities

Box 1.8: Responsibilities of Head of Hospital

b. Waste-management Officer

The waste-management officer is responsible for the day-to-day operation and monitoring of the waste-management system in a hospital.

The role should be allocated to a senior member of staff so that he has access to all the staff members and he shall be directly responsible to head of the institution.

Responsibilities of waste management officer are mentioned in **Box. 1.9**.

a. Implement the waste management plan

b. Ensure waste segregation

c. Control internal waste collection

d. Ensure correct storage

e. Coordinate disposal operations

f. Monitor on-site and off-site transportation of waste

g. Maintenance of records in the prescribed formats at all the stages

h. Liaise with department heads to ensure training is carried out

i. Monitor waste generation, disposal, costs and public health aspects (e.g. injuries) of waste

j. Liaison with regulatory authorities for obtaining of approvals or renewal of approvals within the prescribed time

k. Submission of annual reports to the regulatory authorities as per prescribed formats

l. Co-ordination with the inspection teams or authorities

Box 1.9: Responsibilities of Waste Management Officer

c. Department Heads

Department heads are responsible for the segregation, storage and disposal of waste generated in their respective departments. Responsibilities of department heads are mentioned in **Box. 1.10**.

The department heads should:

a. Ensure that all doctors, nurses, para clinical and support staff in their respective departments are aware and practice highest standards of segregation, sealing and storage procedures

b. Liaise regularly with the waste-management officer to monitor working practices for failures or mistakes

c. Ensure that all staff members in their departments are trained in waste segregation and disposal procedures

d. Ensure that all hospital attendants and auxiliary staff to follow procedures correctly by ensuring vigilance from the hospital staff

e. Ensure proper maintenance of records and its submission to the regulatory authorities by the nursing staff

Box 1.10: Responsibilities of Department Heads

d. Senior Nursing Officer

The senior nursing officer and hospital manager is responsible for training the nursing staff, medical assistants, hospital attendants and ancillary staff in the correct procedures of health care waste management with respect to segregation, collection, storage, transport and disposal of waste. Responsibilities of senior nursing officer are mentioned in **Box. 1.11**.

The senior nursing officer should:

a. Liaise with the waste-management officer, infection-control officer, chief pharmacist and radiation officer to maintain high standards of infection control

b. Participate in training of the staff at induction and on job in safe handling, treatment and disposal of health care waste

c. Liaise with department heads to ensure coordination of training activities, and decide about waste management issues specific to particular departments.

d. Maintenance of records as per Rules or guidelines (BMWM Rules, 2016, as amended in India)

Box 1.11: Responsibilities of Senior Nursing Officer

e. Infection Control Officer

The infection-control officer should liaise with the waste-management officer on a continual basis to ensure the standards of the waste treatment and disposal system in line with infection control. Specific duties related to health care waste management are mentioned in **Box 1.12**.

Specific duties related to health care waste management include:

a. Identifying training requirements according to staff grade and occupation

b. Organising and supervising staff training courses on the infection risks from poor waste management

c. Liaising with the department heads, the matron and the hospital manager to coordinate training

Box 1.12: Responsibilities of Infection Control Officer

f. Hospital Engineer

Hospital Engineer helps in maintenance of safety measures and equipment use in the hospital. They would be responsible for installing, operating and maintaining any on-site treatment facilities which include waste water treatment plant/sewage treatment plant.

g. Chief Pharmacist

Chief pharmacist is responsible for safe management of pharmaceutical waste and also helps in minimising the waste. They are also responsible for ensuring safe management of cytotoxic waste.

h. Supply Officer

Supply Officer should liaise with waste management officer and ensure continuous supply of waste management consumables such as bins, plastic bags, personal protective gears and other materials required for waste treatment.

Responsibilities, duties, and codes of practice for each cadre of health care personnel should be well defined and should be included in the waste management plan of the hospital.

Check Your Progress 5

Match the following personnel with their key responsibility

1.	Waste management officer	a.	Form the waste management team
2.	Head of the hospital	b.	Ensure adequate supplies of consumables
3.	Hospital engineer	c.	Conduct training course on infection risks from waste management to nursing and ancillary staff
4.	Supply officer	d.	Implement the waste management plan
5.	Infection control officer	e.	Maintenance of safety measures and equipment use

1.8 POLICIES, GUIDELINES AND STANDARD OPERATING PROCEDURES FOR HCF

For effective management of health care waste, formulation of policy, guidelines and standard operative procedures for health care waste management is an important administrative action that needs to be addressed. **The various policies, guidelines and SOPs have been defined in this section giving the example of India in compliance with the BMWM Rules, 2016, as amended. The policies are explained in Box 1.13**.

a. Policy

Formulation of written policy indicates the commitment of the hospital or HCF towards management of bio-medical waste according to BMWM Rules, 2016 as amended. Any policy document prepared by the HCF should align with National Policy on Bio-Medical Waste Management.

The policy document should be simple, well-structured and coherent and evidence based. Whenever a policy document is drafted the stakeholders need to be taken into consideration so that the document is understood by all.

b. Guidelines

Guidelines for Bio-Medical Waste Management give details of establishment of comprehensive system of bio-medical waste management from source of generation of waste to final disposal.Various guidelines relevant to the bio-medical waste management issued by CPCB /Govt. of India including bar code system should be followed and implemented.

c. Standard operating procedures (SOP)

SOP describes the practical implementation of the policy and guidelines specific to health care facility. It is suggested that each of the HCF prepare its own SOP. It can act as ready reckoner for health care waste management practices and procedures and ensures compliance to the BMWM Rules, 2016, as amended. SOP documents should be easily accessible at all points of generation. Aspects such as segregation can be depicted pictorially so that, even the waste handlers would be able to comprehend.

Any change in the policy and guidelines needs to be reflected in the SOP documents also. It is a good practice to review SOP documents annually. The document has to be approved with waste management and hospital infection control committees and should be displayed at certain strategic locations in the hospital.

Box 1.13: Policy, guidelines and SOPs

Guidelines for Bar code system

As per Bio-Medical Waste Management Rules, 2016 and further amendments made thereof, it is the duty of every occupier (i.e., Health Care Facility-HCF) to establish a bar code system for bags or containers containing **bio-medical waste** (BMW) to be sent out of the premises or place for any purpose, by 27.03.2019. Also, Rule 5 of the BMWM Rules, 2016 and as amended, stipulates that it is the duty of the every Operator of Common Bio-medical Waste Treatment Facility (CBMWTF) to establish bar code system for handling of **bio-medical waste**. In order to facilitate and provide guidance to the stakeholders (both Occupier as well as Operator of CBMWTF) and to have uniformity in adoption of the bar code system throughout the country, these guidelines have been prepared for ensuring effective enforcement of the BMWM Rules, 2016 and further amendments made thereof. The bar code system serve as an important tool for the regulatory authorities especially for tracking of **bio-medical waste** from source of its generation to the disposal of waste and also helps to serve as instantaneous data base with regard to the **bio-medical waste** generation as well as treatment and disposal of bio-medical waste through a captive or through a Common Bio-Medical Waste Treatment Facility (CBMWTF) and such tracking would avoid pilferage of recyclable **bio-medical waste** (red category) prior to reaching waste collection point within the HCFs or the CBMWTFs.

Responsibility of the Occupier/Operator of a CBMWTF

Responsibility of the Occupier of HCF and Operator of a CBMWTF with regard to the implementation of Bar Code system is given **Fig. 1.7**. Details are also given in the subsequent paras.

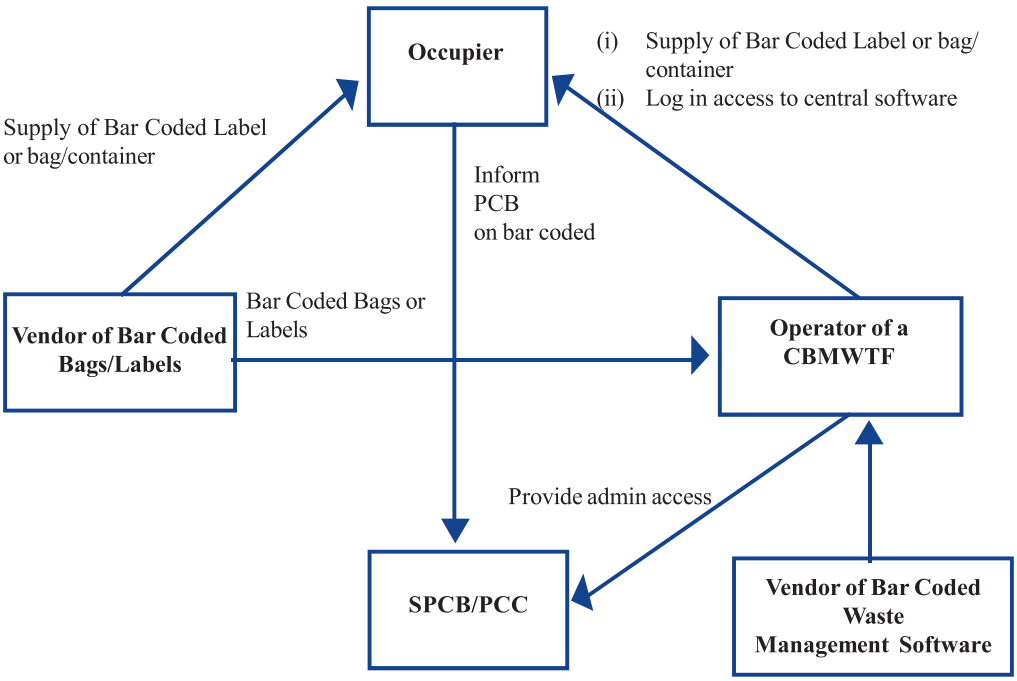

Fig. 1.7: Responsible agencies for implementation of the Bar Code System

Procedure for adoption of the Bar coding system: For easy understanding of the bar coding system for its implementation in the HCFs, the procedure to be adopted by the Occupier or Operator of a CBMWTF is given in the **Fig. 1.8**.

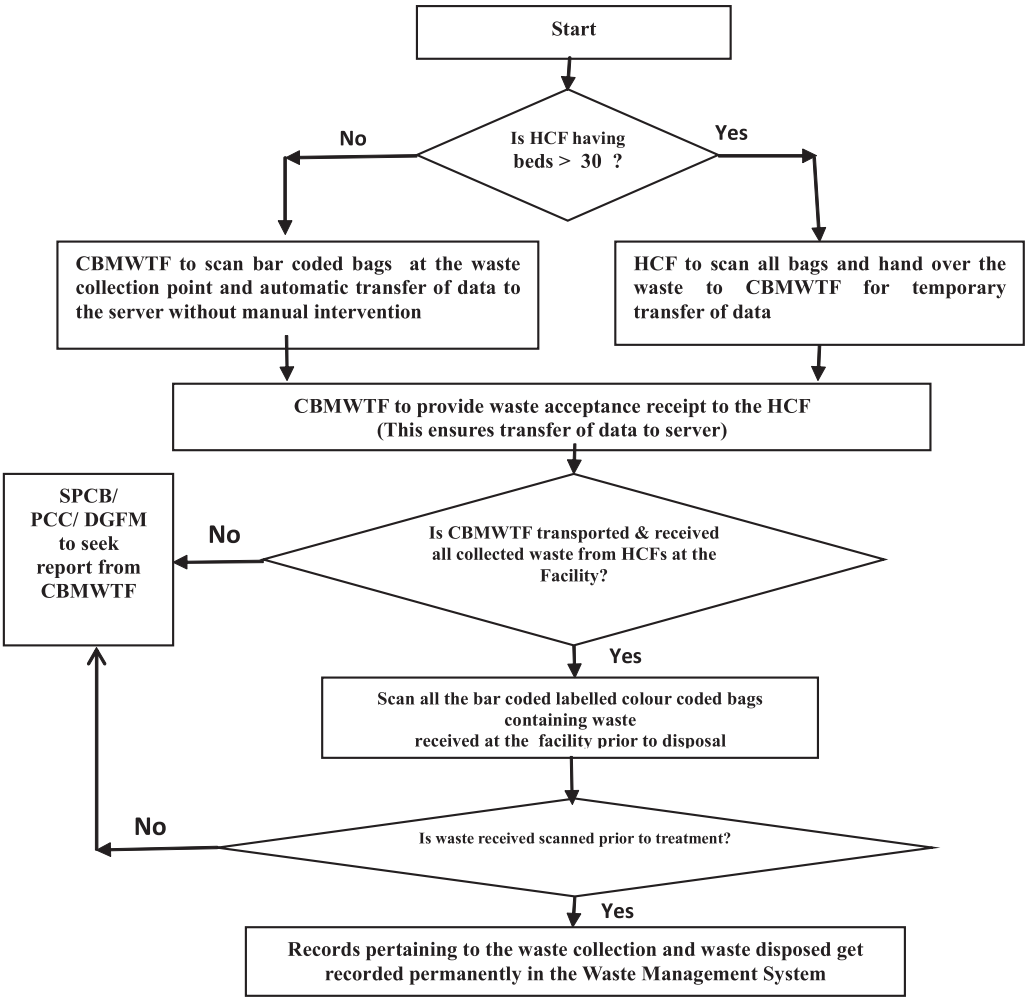

Fig. 1.8: Procedure to be adopted by the Occupier or Operator of a CBMWTF for implementation of the Bar Code System

Did you know ?

SOP acts as a ready reckoner for health care waste management practices and procedures.

For further details, Guidelines for Bar Code System for Effective Management of Bio-Medical Waste Management Issued by CPCB, may please be referred.

Source: www.cpcb.nic.in

1.9 MONITORING

Monitoring is "the performance and analysis of routine measurements aimed at detecting changes in the environment or health status of the population." In management, monitoring refers to the continuous oversight of activities to ensure that they are proceeding according to plan. Monitoring is a management function that is planned and carried out to assist staff in carrying out assigned tasks. Monitoring systems should provide feedback to health care workers, identify weakness and corrections and offer suggestions. It should encourage two way communications. Monitoring systems builds on past gains to meet future goals.

Waste Management Monitoring is the systematic process of collecting, analysing and using information to track the progress toward achieving safe and sound health care waste management systems. Waste management should be monitored regularly. While setting up a new system, the baseline assessment is very important in providing reference data on which to base the plan. The set-up of a monitoring plan as well as adequate control procedures at health facility level is a key issue to ensure sustainability. Regular reporting and auditing are the basis of an efficient monitoring plan.

i. Need for monitoring

Monitoring helps in providing relevant information which is mentioned in **Box 1.14**.

Monitoring helps in providing relevant information of the following:

a. Progress in the implementation of the health care waste management systems in the health care facility
b. Information on the waste generation practice over time for proactive future action
c. Information on the areas of strengths and weakness so as to reinforce the management system with appropriate corrective actions
d. Information on the achievements of set targets and standards
e. Measure the Operation and Maintenance performance of the health services related to HCWM

Box 1.14: Parameters for monitoring

ii. Monitoring plan

Any established system should have an in-built monitoring plan for its optimum functioning and sustainability.

A monitoring plan should include the following as mentioned in **Box 1.15**.

a. Components of the system that needs to be monitored for example,
   i. Practices such as segregation, documentation process, etc
   ii. Consumables – supply of bins and plastic bags, PPE , etc
   iii. Operations such as disinfection, autoclaving etc
b. Who has to conduct
c. Frequency of conduct
d. Feedback and actions
e. Line of control

Box 1.15: Monitoring plan

iii. Method of monitoring

Two types of monitoring mechanism can be established for sustainability of safe and sound health care waste management system. They are explained in **Box 1.16**.

a. **Day to day monitoring:** HCFs can decide on what to monitor on a day to day basis. As segregation is the heart of waste management it is suggested that process of segregation be monitored on a day to day basis however, the frequency and what to monitor can be decided by the HCFs.

b. **Periodic monitoring:** Periodic monitoring of health care waste management should be carried out at supervisory level and managerial staff. The managerial staff should periodically monitor the waste management system :

   i. Segregation at different points of generation

   ii. Transportation system

   iii. Occupational safety issues

   iv. Testing and analysis of the treated liquid waste from treatment plant

   v. Mandatory records to be maintained by HCFs as per country specific guidelines or Rules

   vi. Training and capacity building of the personnel

   vii. Monitoring of financial aspects e.g. costs of materials and consumables

Box 1.16: Types of monitoring mechanism

Frequency can be determined by the HCF either weekly basis or on a monthly basis or in accordance with the per country specific guidelines or Rules

iv. Monitoring tools

Daily monitoring and Monthly monitoring check as given at **Annexure -2** and **Annexure-3** can be used for regular monitoring of the health care waste management systems.

v. Who can monitor?

The following persons as mentioned in **Box 1.17** can monitor.

a. Senior staff nurse

b. Departmental heads

c. Waste management officer

Box 1.17: Who can monitor

vi. Components of monitoring

Box 1.18 mentions components of monitoring

a. At the point of generation viz. quantity, segregation, labelling, collection, handling, use of personal protective equipment by waste handlers, transportation, storage etc. of health care waste.

b. Management of spills like blood, body fluids, chemicals, mercury etc.

c. Inventory management of the equipment, bags, bins, liners etc. necessary for waste management.

d. Maintenance of records like waste management register, injury register etc.

Box 1.18: Components of monitoring

To conclude,waste management being more an attitudinal issue, constant monitoring is critical in maintaining appropriate practices in HCWM. Unless monitored, waste management systems may not function to the optimum level.

Checklist for daily monitoring and monthly monitoring is given in **Annexure-2, Annexure-3.**

Check Your Progress 6

Review the monitoring mechanism existing in your hospital with your administrator.

1.10 EVALUATION

Evaluation of health care waste management systems will help in assessing the situation, identifying the gaps and rectifying the same. The evaluation can be classified as mentioned in **Box 1.19** based on who is conducting the evaluation and periodicity.

Classification based on who is conducting the evaluation

a. **Internal-** Internal evaluation by the in house members of the hospital. It can be done by either the members of hospital infection control committee or waste management committee

b. **External -** Done by external agency which would be more unbiased and realistic

Classification based on periodicity

a. **Periodic-** Evaluation can be done by in house or external agency especially when new modification is made

b. **Annual-** Evaluation can be done as part of hospital policy or part of any accreditation process such as NABH

Box 1.19: Classification of Evaluation

Check Your Progress 7

1. Classify the types of evaluation.

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1.11 DOCUMENTATION AND RECORD MAINTENANCE

Documentation is an important component of management information system. It helps in providing the documentary evidence required for managerial decision making and detection of problems, loopholes in the system. Documentation with respect to health care waste management is important as it provides evidence with regard to processes adopted and protects the occupier against any legal proceedings. Maintenance of records regarding information on certain aspects of health care waste management is mandated according to country specific guidelines or Rules (as per BMWM Rules 2016, as amended in India).

Rule 4 and Rule 14 of the Bio-Medical Waste Management Rules, 2016, as amended, Govt. of India, stipulates Duties of the Occupier as detailed below in Box 1.20.

Rule 4 (g) : Provide information on training conducted on Bio-Medical Waste Management as a part of annual report and also indicate the number of personnel who have not undergone training.

Rule 4 (m): Conduct health check at the time of induction and yearly health check-up of all its health care workers and others involved in Bio-medical waste and maintain the records

Rule 4 (n): Maintain and update day to day basis the bio-medical waste management register

Rule 4 (o): Report major accidents including nil report in Form-I

Rule 4 (p): Make the annual report available on its website

Rule 4 (r): Record of the minutes of the meeting of the committee to monitor and review activities related to bio-medical waste management

Rule 14 - (l): 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 five years in accordance with these rules and guidelines issued by the Central Government or the Central Pollution control board or the prescribed authority

Box 1.20: Duties of the Occupier stipulated under Rule 4 and Rule 14 of the Bio-Medical Waste Management Rules, 2016, as amended

List of records to be maintained by the HCF in compliance to the Bio-Medical Waste Management Rules, 2016 as amended is given in Table **1.1.**

Table 1.1: List of Records to be Maintained by The HCF

Sl. No.	Name of the Record	Responsible Official to be Maintained by	Where to Maintain
1.	Consents under Water (Prevention and Control of Pollution) Act, 1974/ Consent under Air (Prevention and Control of Pollution) Act, 1981/ Authorisation obtained under BMWM Rules or renewal obtained from respective State Pollution Control Board (SPCB) in the State or Pollution Control Committee (PCC) in the Union Territory	Administrator / waste management officer	Can be displayed or maintained at office of head of the HCF
2.	Memorandum of understanding with CBMWTF*	Administrator / waste management officer	Maintained at office of Head of HCF or as deemed necessary
3.	Waste generation register*	Nurse, temporary storage in-charge	At every point of generation of waste in HCF & temporary storage facility
4.	Spill register	Nurse	At every point of generation of waste in HCF & temporary storage facility

5.	Injury register	Nurse/ ICN	At every point of generation of waste in HCF and temporary storage facility
6.	In-house transportation officer	Waste management facility	temporary storage
7.	Transport to CBMWTF officer/ Nursing superintendent	Waste Management facility	temporary storage
8.	Waste disposal through a CBMWTF as per Bar Code System	Waste management officer	At the Nodal Officers Office
9.	Health Records of the personnel*	Administrator	Office of the Hospital Administrator
10.	Immunisation records	Administrator	Office of the Hospital Administrator
11.	Documentation of training conducted*	Administrator/ Nursing superintendent	Office of the Hospital Administrator
12.	Annual report of Bio-medical waste management*	Administrator/ Nursing superintendent/ waste management officer	Office of the Hospital Administrator
13.	Minutes of the waste management/ infection control committee*	Secretary of the committee	Secretary of the committee/ Administrators office
14.	Accident report (Form-I)	Administrator/ Nursing superintendent/ waste management officer	Office of the Hospital Administrator
15.	Records pertaining to operational and efficacy tests for pre-treatment of waste (Autoclave/ Microwave)*	Administrator/Nursing superintendent/ waste management officer	Office of the Hospital Administrator
16.	Record of ETP/STP with analysis of treated effluent for parameters as stipulated under Schedule-II of the BMWM Rules, 2016, as amended	Hospital engineer	Office of Administrator
17.	Record of DG Set /Boiler or any other air emissions with analysis of air emission parameters as per the Consent conditions	Hospital engineer	Office of Administrator
18.	Records of monthly monitoring of waste management systems	Nursing in-charge of the generation points/ administrator	Office of Administrator

* Mandatory as per BMWM Rules, 2016, as amended.

Check Your Progress 8

A. Fill in the blanks.

1. As per the BMWM Rules, 2016, as amended, all the record related to handling of bio- medical waste should be maintained for a period of _____ Years.
2. All major accidents during handling of health care waste management should be reported to the state pollution control board in form ____

B. MCQ

3. Which of the following is not a major accident and need not be reported?
   a. Toppling of vehicle carrying health care waste
   b. Accidental release of untreated waste water into large water body
   c. Needle prick injuries

1.12 COST CONSIDERATIONS TO SET UP HCWM SYSTEMS IN A HCF

One of the guiding principles of health care waste management is "polluter pays" principle, i.e. the polluter has to pay for the management of his or waste in such a way that it doesn't harm human health or environment. It is the duty of the occupier to allocate sufficient budgetary funds for activities pertaining to entire life cycle of health care waste management. Health care waste management systems involves manpower, materials and resources for ensuring efficient functioning and complying with requisite legal provisions of the specific countries (BMWM Rules, 2016, as amended in India).

There are several complexities and considerations involved while developing an efficient economic estimation models for bio-medical waste management. Administrators need to consider health care waste management plan for budgeting **(Box 1.21)**.

a. People, practices, and procedures directly related to HCWM
b. Facility location, regulatory requirements, available resources
c. Waste management alternatives
d. Size of the facility and location wise waste generation points (predominant waste sites)
e. Nature and quantum of waste generated
f. Access to CBMWTF or in-house management as stipulated by the legislation or country specific guidelines

Box 1.21: Health Care Waste Management Plan for Budgeting

i. Major activity based resources required:

Apart from manpower costing, following direct cost incurred for materials need to be considered are mentioned in **Table 1.2**.

Table 1.2: Direct cost incurred for materials

Activity	Resources Required
Direct costs	
Licenses / Sanctions and Permissions	Required from competent authorities by paying the requisite prescribed fees
Linking with CBMWTF	Fees to CBMWTF for final treatment and disposal of generated bio-medical waste
Segregation and containment	Colour coded Bins, bags for different categories of waste and White containers for sharps or hub cutters
Collection of waste	Tags, labels, bar coded stickers,bar code scanner and weighing machine (blue Tooth Based), Bio-hazard labels, manifest labels
In-house transportation	Trolleys, carts and other aids to handle for in-house transportation of waste to temporary waste storage facility
On site pre-treatment of waste	Autoclave/ microwave, needle destroyers, chemical disinfectants as stipulated under BMWM Rules, 2016, in India or if required by the legislation/and guidelines of the respective countries
Storage area	Temporary waste storage unit , cleaning equipment
Emergency response	Spill kits, fire safety equipment
Occupational safety of health care personnel	i. Personal protective gears such as gloves, mask, gown etc
	ii. Immunisation of health care workers with Hepatitis B and TT
Operation costs	i. Effluent treatment plant /Sewage Treatment Plant
	ii. Autoclave/microwave
O & M of Treatment Equipment	i. ETP/STP ii. Pre-Treatment Equipment
Analysis cost charges	i.Treated Effluent/Air Emissions
Indirect costs	
Training cost	Training materials Resource person Refreshments
Awareness creation	Development, printing and dissemination of information, educational and other relevant material 1. SOPs 2. Charts and posters 3. Videos etc

ii. Major cost headers

Sample cost header is presented below in **Table 1.3** keeping in mind the activity based resources.

Table 1.3: Sample cost header

Cost Header	Segregation & Containment	In-House Transport	Final Disposal
Manpower:	Eg:	Eg:	Eg:
Material Cost			
Direct costs:			
Capital costs:	Eg:	Eg:	Eg:
Recurrent costs:	Eg:	Eg:	Eg:
Indirect Costs:			
Overhead costs:	Eg:	Eg:	Eg:
Contingency costs:	Eg:	Eg:	Eg:

Indicative list as provided by the UNDP-GEF-WHO document is mentioned in **Box 1.22** below.

Capital costs could include:

a. Waste management equipment such as plastic or metal bins, wheeled carts, trolleys, weighing scales, skips or dumpsters, compactors, segregation posters

b. Site preparation, and construction or renovation of storage areas and treatment areas

c. Treatment technology and related accessories

d. Shipment, customs fees, installation, start-up and commissioning of the treatment technology

e. Waste transport vehicles

f. Construction of trenches or burial pits for waste disposal

g. Construction of waste storage areas

Operating/ Recurrent Costs Could Include:

a. Wages and benefits for the HCWM coordinator, waste worker, treatment technology operator, waste transport vehicle driver, etc.

b. Consumable items, such as plastic bags, sharps boxes or disposable sharps containers, labels, cleaning supplies, uniforms, PPE, disinfectants

c. Fuel costs, such as diesel or gas for the treatment system and diesel or gasoline for the transport vehicle

d. Utilities: Electricity, water, steam and other utilities used by the treatment system

e. Maintenance and repair costs, spare parts

Overhead/ Additional Costs Could Include:

a. Administrative and project management costs

b. Staff training

c. Regulatory fees

d. Renting or leasing of equipment

e. Sewage treatment costs

f. Landfill tipping fees

g. Fees paid to an outside company to pick up, transport, treat and dispose of health care waste (for facilities that use a service provider)

h. Employee benefits such as health insurance and immunisation of waste workers

Contingency Costs Could Include:

a. Expenditure towards equipment breakdown, spills, injuries and other accidents

Box 1.22: Item heads under different costs

iii. Costing tools

WHO costing tools are available which assist in estimating the total costs for management of health care waste which are mentioned in **Box 1.23**.

a. Cost Analysis Tool (CAT) - help to estimate and calculate costs relating to HCWM at national and health care facility levels.

b. Expanded Cost Analysis Tool (ECAT) - is a modified version of the cost analysis tool (CAT) which provides more options and approaches than the CAT. This helps the user estimate costs related to HCWM at the health care facility, central treatment facility or cluster, and national levels. Versions ECAT-L, ECAT-M and ECAT-H are for low income, medium-income and high-income countries, respectively.

Box 1.23 : Costing tools as given by WHO

To conclude, apart from the responsibility of the occupier, manufacturers should also share responsibility to take waste management into account in the development and sale of their medical products and services.

Check Your Progress 9

Match the following:

1. Capital cost	a. Salary of ETP manager
2. Recurrent cost	b. Cost towards equipment breakdown
3. Overhead cost	c. Installing the ETP
4. Contingency cost	d. Regulatory fees

1.13 PURCHASE POLICY FOR HEALTH CARE WASTE MANAGEMENT SYSTEMS

Purchasing policy should be in line with the hospital policy. Wherever possible green purchase policy, First-In and First-Out (FIFO) principle will help in reduction of waste generation. Inventory control in pharmacy and store room is useful in reduction of waste generation. Employing reusable and recyclable products will help in better resource management. The technical specifications for health care waste management bags and containers PPE, and for treatment are given in **Annexure-4**.

Check Your Progress 10

Fill in the blanks.

1. Recommended concentration of sodium hypochlorite for chemical disinfection is _____%
2. Autoclave works on the principle of _____

3. Microwave works on the principle of _____

Answer the following:

4. Enlist any two advantages of each of autoclave and microwave.

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5. Name any two waste that can be pretreated using autoclave at the health care facility level.

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1.14 TRAINING

Training must be an important component of health care waste management.

According to rule 4 (g) of the BMWM Rules 2016, as amended, Govt. of India it is the duty of the occupier to provide training to all its health care workers and others, involved in handling of bio-medical waste at the time of induction and thereafter at least once every year and the details of training programmes conducted, number of personnel trained and number of personnel not undergone any training shall be provided in the Annual Report. Health care waste management is an attitudinal issue and hence training and retraining with reinforcement with emphasis on attitudinal change is very much essential for the system to be effective.

Training in health care waste management

Advantages of training in health care waste management is mentioned in **Box 1.24**.

Advantages of training in Bio-Medical Waste Management

a. Help in enhancing the existing institutional and technical capacity
b. Help improve the efficiency of segregation of medical wastes at source and thereby improves the management of waste at CBMWTF
c. Help to adhere to standard protocols developed for the waste management in health care facility
d. Establish the integrated system for medical waste management and disposal

Box 1.24: Training in health care waste management

Training all levels of health care personnel is important for a good health care waste management system in place. Training for doctors is as important as training for waste handlers. All health care personnel must receive training initially and annually also.

Suggested components of training in health care waste management are mentioned in **Box 1.25**.

1. **Contents of training:** Contents of the training remains same but the emphasis and in depth training varies based on the different target groups and the methodology of training also varies.

Contents	Administrators	Doctors	Nurses, Technicians and Waste Managers	Waste Handlers
BMWM Rules 2016, as amended	+++	++	++	+
Importance of health care waste management	+++	+++	+++	+++
Hazards of health care waste	+++	+++	+++	+++
Life cycle process of waste management	+++	+++	+++	+
Segregation and containment	+++	+++	+++	+++
Disinfection	+	++	+++	+++
Collection and transportation	+	+	+++	+++
Storage	++	+	+++	+++
On site treatment options	++	+	+++	+++
Policy, guidelines and SOPs of the health care facility	+++	+++	+++	+
Information on emergency plans	+++	+	+++	+
Roles & responsibilities of each of the personnel in Health care waste management	+++	++	+++	+
Use of PPE	++	++	+++	+++
Spill management speciallyblood and body fluid	++	++	+++	+++
Line of authority for reporting of chemical spills/mercury spills or injuries	+++	++	+++	+++

Note: The above contents is just illustrative. Depending on the level of knowledge and the kind activities undertaken, the contents can be emphasised during the training.

2. **Frequency of training:** Frequency of training of different levels of health care personnel can be decided by the respective HCFs. Every Health care personnel needs to be trained at induction and on an annual basis. Monitoring and on-job training will help in streamlining any deficiencies found.
3. **Types of learners:** The training programme should be designed based on the different learning styles of the health care personnel. Basically five type of learners should be kept in mind:

a. **Visual -** Visual learners require to visualise simple, easy-to-process diagrams or the written word for their learning. Ex. Power Point presentations, Flip chart graphics, Charts, Posters

b. **Aural -** Aural learners need to hear something so that they process and learn. They prefer to read aloud if presented with written material. They enjoy lecture format learning. Ex. Interactive lecture session

c. **Tactile -**Tactile learners need to do something hands-on in order to learn. They tend to avoid written directions and jump right into a hands-on attempt to work it out. Ex. Demonstration, Hands on training

d. **Interactive -** Interactive learners discuss the concepts and learn. Open discussions and Question and Answer (Q & A) facilitate this type of learning. Ex. Demonstration followed by Q & A (Quiz), Pre-test / Post-test

e. **Kinesthetic -** Kinesthetic learners learn through movement during learning process. Training exercises and role plays help. Giving people the flexibility to stand and move about the classroom also helps these learners. Ex:. Learning by Doing (Spill management, Hand washing). Especially for waste handlers more of hands on training, demonstration, and learning by doing will be more effective than didactic lectures. Administrator of the HCF has to plan and implement training programmes for all the different level of health care workers as stated in BMWM Rules 2016 as amended.

f. **Logical -** Logical learners prefer logic and reasoning to learn.

g. **Social -** Social learner prefer to learn in groups and with other people. e.g. group discussions, buzz session etc.

Box 1.25: Components of training in Bio-medical waste management

Check Your Progress 11

Match the following learning methods with examples of teaching

1.	Visual	a.	Learning by doing
2.	Aural	b.	Quiz
3.	Tactile	c.	Lecture
4.	Interactive	d.	Hands on training
5.	Kinesthetic	e.	Group discussion
6.	Social	f.	Poster

1.15 LET US SUM UP

In this unit, as an administrator of the hospital, we have learnt the components for setting up of health care waste management. It is important to develop standard operating procedures, Policy and guidelines to be in place for effective implementation for handling bio-medical waste with respect to occupational safety. Establishing and having a functional infection control committee and a health care waste management committee will help to establish and maintain systems in high standards. As an administrator the cost

considerations for health care waste management are to be kept in mind. Training and retraining of health care personnel will support the health care waste system to be maintained. The concepts covered in this unit have been summarised in the mind map **(Fig. 1.9)**.

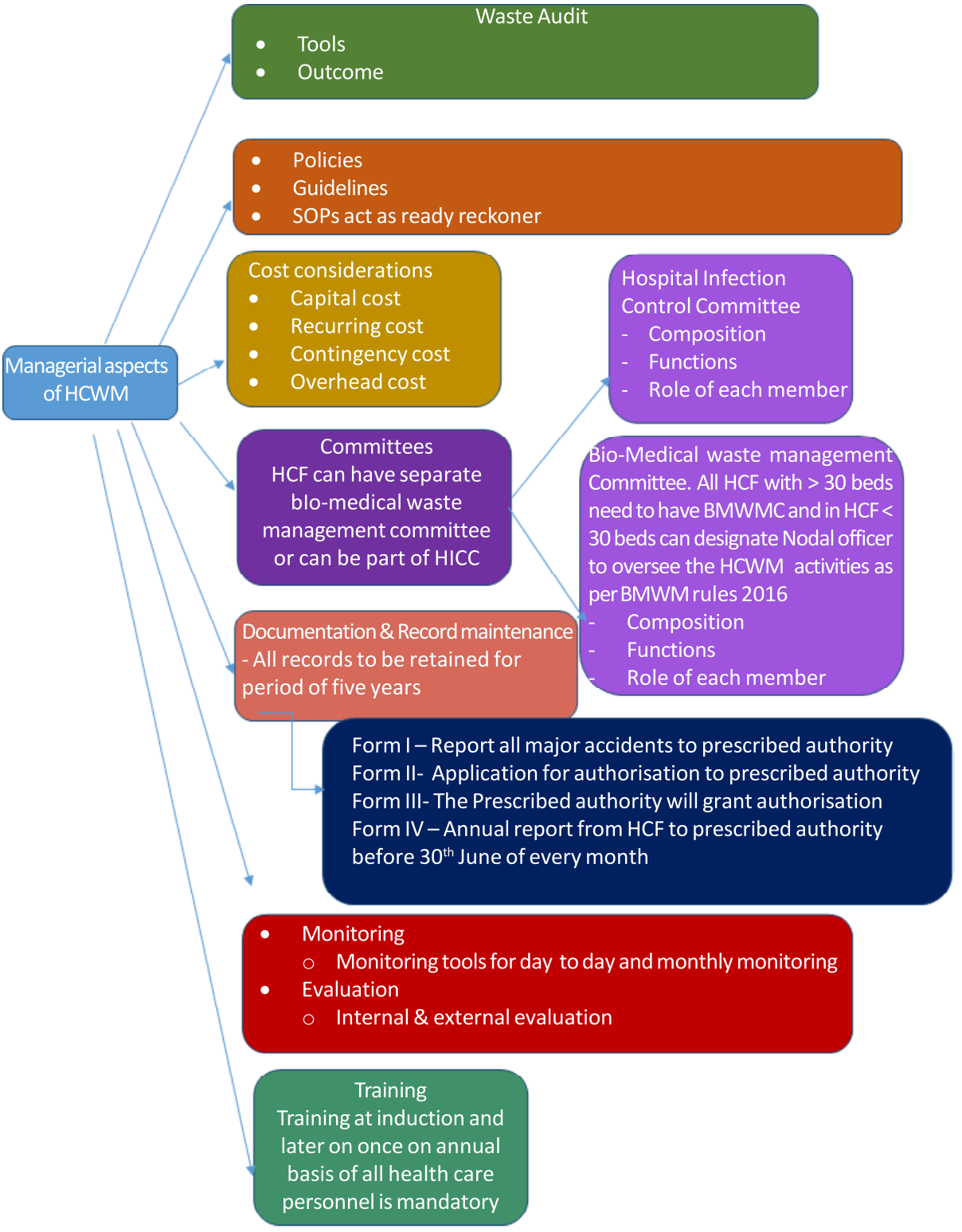

Fig. 1.9: Mind Map

1.16 GLOSSARY

HAI : 'Healthcare associated infection' are those infections that were neither present nor incubating at the time the patient's admission to health care facility. Any infections occurring after 48 hours is considered as HAI.

Waste Audit : A waste audit is a methodically process to determine the amount and types of waste that are generated in a health care setting.

Monitoring : Monitoring is "the performance and analysis of routine measurements aimed at detecting changes in the environment or health status of the population."

Evaluation : Evaluation is a systematic and objective assessment of an ongoing or completed programme or policy, its design, implementation and results.

BMW : Bio-Medical Waste

BMWM : Bio-Medical Waste Management

BOD : Biochemical Oxygen Demand

CBMWTF : Common Bio-Medical Waste Treatment Facility

COD : Chemical Oxygen Demand

DLMC : District Level Monitoring Committee

HCFs : Health Care Facilities

HCW : Health Care Waste

HCWM : Health Care Waste Management

Hg : Mercury

HICC : Hospital Infection Control Committee

HIV : Human Immunodeficiency Virus

HWTSDF : Hazardous Waste Treatment Storage & Disposal Facilities

PPE : Personal Protective Equipment

PPP : Public Private Partnership

SLF : Sanitary Landfill

SOP : Standard Operating Procedure

: State Pollution Control Board

SPM : Suspended Particulate Matter

TNA : Training Needs Assessment

ToTs : Training of Trainers

WHO : World Health Organisation

1.17 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

Five basic components of establishing sound management of health care waste (any five can be mentioned)

- Conducting a waste audit
- Assignment of responsibility for waste management
- Allocation of sufficient human and financial resources

- Waste minimisation
- Identification of sources of generation of waste
- Segregation and Pre-treatment of waste at source
- Temporary waste storage area
- On site and off site transportation
- Final treatment and disposal
- Occupational safety
- Record maintenance
- Monitoring & Evaluation
- Periodic Training

Check Your Progress 2

1. Waste audit is analysis of the waste stream in your facility
2. List any two outcomes of waste audit
   - Inventory of waste generation sources and quantum of category-wise waste generation
   - Preparation of action plan to develop and evolve a system in place.
   - Laying down of health care waste management systems

Check Your Progress 3

1. Surveillance
2. Monitoring
3. Hospital acquired infections
4. Policies

Check Your Progress 4

1. c. Surveillance of hospital acquired infections
2. 30

Check Your Progress 5

1-d; 2-a; 3- e; 4- b; 5- c

Check Your Progress 6

Review the monitoring mechanism existing in your hospital with your administration. Discuss about who monitors, frequency of monitoring and action taken following monitoring.

Check Your Progress 7

- Based on person who conduct - External and Internal
- Based on period - Periodical and Annual

Check Your Progress 8

1. Five

2. Form-I
3. Needle stick injuries

Check Your Progress 9

1- c; 2- a;3-d;4- b

Check Your Progress 10

1. 1-2%
2. disinfection by steam under pressure and high temperatures
3. steam-based process where treatment occurs through the action of moist heat and steam generated by microwave energy
4. (i) Advantages of autoclave
    a. Produces Significantly Less Air Pollution Emissions Than High-heat Thermal Processes
    b. Low Capital And Operational Cost

    (ii) Advantages Of Microwave
    a. Causes Significantly Less Air Pollution Emissions Than High-heat Thermal Processes
    b. Significant Volume Reduction
    c. Automated And Easy To Use
5. Waste That Can Be Autoclaved Are Blood Bags And Lab Waste

http://www.who.int/water_sanitation_health/medicalwaste/034to057.pdf

http://siteresources.worldbank.org/INTUSWM/Resources/463617-1210023020779/Topic6healthcarewm.pdf

http://siteresources.worldbank.org/INTUSWM/Resources/463617-1210023020779/Topic6healthcarewm.pdf

Check Your Progress 11

1- f; 2- c; 3- d; 4- b; 5- a 6-e.

1.18 REFERENCES AND FURTHER READINGS

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Annexure 1- Action Plan

Areas that Need Attention	Action Needed	Resources Needed	Persons Responsible	Time Frame
Conducting a waste audit	a. To conduct waste audit using the survey proforma provided HCF viz. b. Gap analysis and delineate the follow up actions required c. Identify the training needs and training requirements	Survey format Weighing machine	Identify the persons responsible in their respective Nursing supervisor/ nodal officer for waste management/ Infection control nurse	One week
Developing a model demonstration site	a. Based on waste audit identify the responsible demonstration site (Preferably a site where all four categories of waste is generated) b. Based on the quantum and category of waste generated, place appropriate sized, colored and labelled waste bins c. Display Segregation chart, SOP and IEC materials d. Place injury and waste management registers for documentation e. Implement SOP	a. Appropriate colour coded bins and liners b. Segregation chart c. Standard Operating Procedures (SOP) chart d. IEC materials e. Registers for documentation	Identify person Nursing personnel in charge of the identified demonstration site	One month
Capacity building	a. Identify the training needs and training requirements based on waste audit conducted b. Draw up two training schedules, one for doctors & nurses and the other for waste handlers c. Identify the resource personnel	Venue Audio Visual aids Training materials Resource persons	Health care facility in charge (Medical Officer/Medical Superintend/ Nursing Superintend/ Infection Control Officer/ Nodal person for waste management	One month

Areas that Need Attention	Action Needed	Resources Needed	Persons Responsible	Time Frame
	d. Identify the trainees e. Date, venue, time and number of trainees per batch			
Segregation and containment	a. Identify points of generation b. Based on the quantum and category of waste generated, indent and place appropriate sized, colored and labelled waste bins c. Display Segregation chart, SOP and IEC materials d. Place injury and waste management registers for documentation. e. Implement SOP	a. Appropriate colour coded bins and liners b. Segregation chart c. Standard Operating Procedures (SOP) chart d. IEC materials e. Registers for documentation	Nursing personnel in charge of the respective identified points of generation	One month
Pre-treatment of waste disinfection	a. Identify the items to be pre-treated at each of the points of generation as per the BMWM Rules 2016 b. Ensure adequate treatment duration as per BMWM Rules c. Ensure the use of appropriate Personal protective equipment like gloves and goggles during the process of pre-treatment	a. Autoclave or microwave or 1-2% sodium hypochlorite solution b. Appropriate personal protective equipment c. Adequate size of plastic container in case of disinfection	Nursing personnel in charge of the respective identified points of generation	Two weeks
Transportation	a. Identify the route within the health care facility from points of generation to storage to avoid high risk areas. b. Route should be from clean area to dirty area c. Determine the frequency and time at which waste is transported to interim storage area	a. Get secured trolley or large bins - portable (with wheels) b. PPE during transportation	Waste handler	Two months

Areas that Need Attention	Action Needed	Resources Needed	Persons Responsible	Time Frame
	d. Mode of transport: preferably closed containers. e. Ensure segregation is maintained during transportation			
Interim storage area	a. Identify the storage area that is away from the health care facility b. Storage area to be need to be accessible to authorised personnel only c. Floor of the storage area should be impermeable d. Facilities for cleaning, fire extinguishing and spill management should be present in storage area e. Segregation should be maintained in the storage area till it is handed over to treatment facility	a. Physical facility with adequate lighting and ventilation b. Personal protective equipment c. Other equipment as deemed fit	Hospital Engineer/ Nursing Superintendent Waste Handler	Six months
Final disposal	a. Hand over waste to common treatment facility (CBMWTF) b. In the absence of CBMWTF facility within a distance of 75 kms, onsite treatment facility can be established after obtaining authorisation from State Pollution Control Board	a. MOU with CBMWTF b. On site treatment facilities complying with BMWM Rules, 2016	CBMWTF	With immediate effect
Committees	a. Formulate Infection Control Committee/ Waste management Committee b. Formulate the scope, roles and responsibilities of the committee c. Formulate policies for the hospital	Staff from different departments of hospital	Chief Hospital Administrator	One month

Areas that Need Attention	Action Needed	Resources Needed	Persons Responsible	Time Frame
	pertaining to infection control, waste management and occupational safety d. Identify the documents that needs to be maintained			
Documentation	a. To maintain registers at all points of generation	a. Registers for recording	Nurishing superinteddent/ administrator and nursing personnel at each points of generation	One month
Occupational safety	a. Identify the areas of high risk b. Implement health care facility's policy on occupational safety. c. Implement policy on PEP d. Ensure PPE	a. PPE b. Vaccines for as per the policy on PEP and occupational safety	Chief Administrator of the Hospital	Two months
Monitoring	a. Identify the monitoring team b. Identify the high risk areas to be monitored c. Identify the frequency with which monitoring is done d. Identify the hierarchy of flow of follow up actions	a. Monitoring formats b. Monitoring teams	Committees can identify the monitoring teams. A combination of staff nurse and Doctor would be preferable	Ongoing activity

Annexure-2

Daily Monitoring Checklist

Date	Yellow Bin		Red Bin		Blue Bin		Sharp Container		Score Out of 4
	Proper	Improper	Proper	Improper	Proper	Improper	Proper	Improper	
1									
2									
3									
4									
5									
6									
-									
-									
-									
-									
-									
-									
-									
-									
-									
-									

Annexure-3

Monthly Monitoring Checklist

No.	Locations Evaluated

Date :	Time :
Name of the monitors	Signature
1.	
2.	

A. Segregation Practices

Sl No. Locations evaluated		1	2	3	4	5
1.	Segregation is proper (Yes=1, No=2)					
2.	Spill observed outside the bin (Yes=1, No=2)					
3.	Segregation score in dressing trolley					

B. Management of sharps (containment measures)

Sl No. Management of sharps		1	2	3	4	5
1.	Is sharps contained in puncture proof container (Yes =1 No = 0)					
2.	Is the sharp container overfilled during your visit (YES =1 No=0)					

C. Worker's safety (Interview the Waste handlers)

Sl No. Worker's safety	1	2	3	4	5
1. Are trained to use PPE (Yes=1, No=0)					
2. Are supplied with necessary PPE (Yes =1, No=0)					
3. During the visit, were they using PPE while handling waste (Yes =1. No=0)					

D. Record maintenance

Sl No. Record maintenance	1	2	3	4	5
1. Are records in waste management register updated till date (Yes =1. No =0)					
2. Are records in injury register updated till date (Yes =1. No=0)					
3. In the event of an injury has it been informed to ICN (Yes =1.No=0)					

E. Other observations

Sl No. Other observations	1	2	3	4	5
1. Display of SOP at strategic locations (Yes =1. No =0)					
2. Spill kit present (Yes =1. No =0)					

F. Statistics

No.	1	2	3	4	5
No. of spills in last one month					

G Non compliances

Non compliances	1	2	3	4	5
No. of NCs observed this month					
No. of NCs observed last month					
No. of NCs corrected					
No. of NCs remaining					

Any specific observations and comments

Ward	Observations and comments	Suggestions and action taken	No. of NCs this month	No. of NCs last month	No. of NCs corrected	No. of NCs remaining

(a) Technical specifications for containers and bags

Waste kind	Type of waste	Type of containers	Bags *	Symbol
Infectious waste (YELLOW)	Human Anatomical Waste	Yellow colored leak-proof plastic or metal or steel containers	Yellow colored non-chlorinated plastic bags more than 50 microns thickness	BIOHAZARD
	Animal Anatomical Waste			
	Soiled Waste			
	Chemical Waste Expired or Discarded Medicines	Yellow colored leak-proof plastic or metal or steel containers	Yellow colored non-chlorinated plastic bags more than 50 microns thickness	
	Discarded linen, mattresses, beddings contaminated with blood or routine mask and gown.	Non-chlorinated yellow plastic bags or suitable packing material		
	Microbiology, Biotechnology and other Clinical Laboratory waste	Autoclave or Microwave or Hydroclave safe plastic bags or containers"		
	Cytotoxic waste	Yellow colored leak-proof plastic or metal or steel containers	Yellow colored non-chlorinated plastic bags with more than 50 microns thickness	C
Contaminated waste (Recyclable) (RED)	Plastics	Red colored leak-proof plastic or metal or steel containers	Red colored non-chlorinated plastic bags with more than 50 microns thickness	BIOHAZARD
	Gloves			
Waste sharps (WHITE)	Metallic Waste sharps (both used, discarded and contaminated)	White translu-cent Puncture proof, Leak proof, tamper proof container		BIOHAZARD
Glassware/ Metallic body implants	Broken or discarded and contaminated glass except those contaminated with cytotoxic wastes	Puncture proof and leak proof boxes or containers with blue colored marking		BIOHAZARD
	Metallic Body Implants			

(b) Technical specifications of PPE

Equipment	Use	Technical Specifications
1. Cap or head cover	Protects scalp	Should cover the hair Material could be disposable or plastic which can be recycled
2. Goggles or face shield	Protects eyes	a. Provides protection to eyes from blood or body fluid splash b. Should be reasonably comfortable to wear c. Should fit snugly and not unduly interfere with the movements of the wearer d. Should be durable and reusable e. Be capable of being disinfected so that it can be reused f. Should not interfere with any existing prescriptive eyewear of the user
3. Face mask, respirator	Protect mouth/ nose, protect respiratory tract from airborne infectious agents, dust, fiber, fumes, mist, soot, and smoke	a. Should be reasonably comfortable when worn b. Should fit snugly and not unduly interfere with the movements of the wearer c. Should be made of material that is capable of being disinfected regularly d. Should have a strap that is either elastic or adjustable e. Should be made of silicone or thermal plastic polymer f. Available in minimum of three sizes: small, medium, and large g. Size dimensions will vary by manufacturer **Specifications for the cartridges:** a. Is able to achieve the National Institute for Occupational Safety and Health P100 or N100 rating, or equivalent European Committee for Standardisation certification. P100 cartridges will protect against any particulates, including oil-based materials. N series cartridges protect against solid and water-based particulates such as nuisance dust b. Contains a granular or porous mate rial-such as carbon or coconut which removes specific air particulates c. Is available in bayonet, push-in mounted cartridge, or canister form; is able to remove 99.9% of dusts and non-oil-based mists d. Enables easy breathing during use

4. Gown or apron	Protect skin and/or clothing	a. Natural or man-made b. Reusable or disposable c. Resistance to fluid penetration d. Should be able to clean and disinfect
5. Gloves for waste handling	Protect hands	a. Heavy duty rubber gloves b. Durable, reusable design that is able to withstand periodic disinfection c. Available in sizes appropriate for all cleaning staff in the health care facility d. Prevent contact with blood borne pathogens contained in health care waste e. Made from puncture-resistant materials to protect against needle sticks and cuts from other sharps
6. Impermeable shoes or gum boots	Protects feet	a. Made from cut-resistant materials b. Slip-resistant sole c. Puncture-resistant sole d. Protective against minimal impact e. Fit snugly and not unduly interfere with the movements of the wearer f. Durable g. Capable of being disinfected h. Available in sizes to fit all waste handlers (toes should be about 12.5 mm from the front) i. For incinerator operators, boots should be made from heat-resistant materials when available

Think and reflect

Do you that PPE is more useful to protect ourself from exposure to injury and illness at our workplace. We very often tend to neglect. Reflect as why we don't wear PPE during our work whenever it is required.

c. Technical specifications for treatment

The technical specification of the treatment equipment such as incinerator, autoclave or microwave, chemical disinfection, shredder etc as prescribed under should be such that it should comply with the specifications, operating standards, emission standards or effluent discharge standards as well as efficacy test specified under the country specific legislation or guidelines, in India the Bio-Medical Waste Management Rules, 2016, as amended.

UNIT 2 LEGAL ASPECTS OF HEALTH CARE WASTE MANAGEMENT

Structure

2.0 Objectives

2.1 Introduction

2.2 Regulatory Principles

2.3 International Conventions
- 2.3.1 Stockholm Convention
- 2.3.2 The Basel Convention

2.4 National Laws
- 2.4.1 Evolution of Environment Related Laws in India
- 2.4.2 The Environment (Protection) Act, 1986
- 2.4.3 Evolution of Bio-Medical Waste Management Rules in India
- 2.4.4 Salient Features of BMWM Rules, 2016, as amended for ensuring Safe Management of Bio-Medical Wate

2.5 Legal Aspects for Effective Implementation of Bio-Medical Waste Management
- 2.5.1 Authorisation
- 2.5.2 Maintenance of Records
- 2.5.3 Annual Report Submission
- 2.5.4 Accident Reporting
- 2.5.5 Monitoring and Review

2.6 Violations and Penalties
- 2.6.1 Common Violations
- 2.6.2 Action by Prescribed Authority in Event of Violations by HCF
- 2.6.3 Appeal

2.7 Frequency Asked Questions by the HCFs

2.8 Case Studies

2.9 Let Us Sum Up

2.10 Glossary

2.11 Answers to Check Your Progress

2.12 References and Further Readings

2.0 OBJECTIVES

After studying this unit, you should be able to:

- discuss important international conventions relevant to the waste management
- national legislations and regulatory principles for management of bio-medical waste
- describe the salient features of Bio-Medical Waste Management Rules, 2016, as amended (hereafter referred as BMWM Rules, 2016) in India
- understand the legal aspects for implementation of Bio-Medical Waste Management Rules, 2016, as amended

2.1 INTRODUCTION

In previous unit, you have read about administrative aspects of managing health care waste management. Although the previous unit was in general with regard to the health care waste management with examples from the Indian context, in this unit you will study the legal aspects related to health care waste management mainly in the Indian context and in reference to the Bio-Medical Waste Management Rules, 2016, as amended.

Regulatory approach is one of the ways in which a requisite system can be put in place. There are more than 35 legislations relevant to the health care facilities (HCFs) of which Bio-Medical Waste Management Rules, 2016, as amended (BMWM Rules) is one of the important rules directly related to bio-medical waste management in the Country. Administrative head or occupier of a health care facility has not only a moral responsibility but also a legal responsibility to manage his/her waste in an environmentally sound manner such that it does not harm human health or environment.

2.2 REGULATORY PRINCIPLES

You have already read about the key principles that govern management of health care waste in Unit 8, Block 2, BHM-101. The same have been summarised for you again **(Box 2.1)**.

The "Polluter pay's principle" implies that all producers or occupiers or generators of waste are whole and sole responsible for safe management and disposal of the waste in accordance with the rules notified under the Environment (Protection) Act, 1986. This means that those who generate waste have to meet the cost that is required for management of waste generated. This justifies the need to pay to the common bio-medical waste management facility to manage waste.

The "Precautionary principle" is a key principle governing health and safety protection. The precautionary principle states that an absence of conclusive or definitive scientific evidence of risk of severe damage to humans and/or the environment should not be a reason for postponing cost effective measures to prevent environment degradation. It is important to take all the necessary precautions assuming the risk and hazards of health care waste until and unless proved otherwise.

The "Proximity principle" recommends that treatment and disposal of health care waste take place at the closest possible location to its source in order to minimise the risks involved during its transportation. This explains the need for disinfection of infectious waste at health care facility.

The "Duty of care principle" stipulates that any person handling or managing infectious substances or related equipment is ethically responsible for using the utmost care in the task. Hence it is the duty of the health care personnel to handle health care waste safely.

The "Environmental clearance" requires that the probable communities and other stakeholders need to be appraised of the hazards and risks involved in establishing infrastructure relating to HCF and operation of bio-medical waste treatment and disposal facilities. This is applicable especially for

setting up of health care facility having more than the requisite built-up infrastructure and bio-medical waste treatment and disposal facility such as the common bio-medical waste treatment facility (CBMWTF) to seek environmental clearance prior to its commissioning.

Box 2.1: Principles that govern management of health care waste

Source: Safe management of wastes from health-care activities, WHO 2014

Check Your Progress 1

Match the following

1. The " Polluter Pay " Principle	a. Affected communities and other stakeholders need to be apprised of the hazards and risks involved in operating waste treatment and disposal facilities
2. The "Duty of care principle"	b. Absence of evidence should not postpone the cost effective measures to prevent environment degradation
3. The "Proximity principle"	c. Emphasise taking personal protection and handling of waste carefully
4. "Environmental Clearance"	d. Emphasise on minimisation of risk during transportation
5. The "Precautionary principle"	e. Emphasise the responsibility of occupier to meet the cost for the management of the waste they generate

2.3 INTERNATIONAL CONVENTIONS

Important international legislations in the context of health care waste have already been discussed in the Unit 26, Block 3, BHM-102. Let us recap the important ones.

2.3.1 Stockholm Convention

The Stockholm Convention is a global treaty to protect human health and the environment from Persistent Organic Pollutants (POPs). The Stockholm Convention was framed in 2001 and came to force in 2004. The convention requires its parties to take measures to eliminate or reduce the release of POPs into the environment.

POPs are chemicals that remain intact in the environment for longer periods, become widely distributed geographically, accumulate in the fatty tissue of humans and wildlife, and have harmful effects on human health or environment.

Exposure to POPs can lead to serious health effects such as cancer, birth defects, dysfunctional immune and reproductive systems, increased susceptibility to disease and damage to the central as well as the peripheral nervous system.

Objective of Stockholm convention- To protect human health and the environment from persistent organic pollutants.

Among the POPs, the pollutants that are released due to improper combustion of Plastic medical waste are Dioxins and Furans.

The list of the POPs and their source is given in **Table 2.1**.

Table 2.1: List of POPs and their source

Sl. No.	POP (Dirty Dozens)	Global Historical Use/Source
1.	Aldrin	i. Insecticides used on crops such as corn and cotton; also used for termite control.
2.	Dieldrin	
3.	Chlordane	i. Insecticide used on crops, including vegetables, small grains, potatoes, sugarcane, sugar beets, fruits, nuts, citrus, and cotton. Used on home lawn and garden pests. ii. Also used extensively to control termites.
4.	DDT	i. Insecticide used on agricultural crops, primarily cotton, and insects that carry diseases such as malaria and typhus.
5.	Endrin	i. Insecticide used on crops such as cotton and grains. ii. Also used to control rodents.
6.	Mirex	i. Insecticide used to combat fire ants, termites, and mealybugs. ii. Also used as a fire retardant in plastics, rubber, and electrical products.
7.	Heptachlor	i. Insecticide used primarily against soil insects and termites. ii. Also used against some crop pests and to combat malaria.
8.	Hexachloro-benzene	i. Fungicide used for seed treatment. ii. Also an industrial chemical used to make fireworks, ammunition, synthetic rubber, and other substances. iii. Also unintentionally produced during combustion and the manufacture of certain chemicals. iv. Also an impurity in certain pesticides.

Sl. No.	POP (Dirty Dozens)	Global Historical Use/Source
9.	Polychlorinated dibenzofurans (PCBs)	i. Used for a variety of industrial processes and purposes, including in electrical transformers and capacitors, as heat exchange fluids, as paint additives, in carbonless copy paper, and in plastics. ii. Also unintentionally produced during combustion.
10.	Toxaphene	i. Insecticide used to control pests on crops and livestock, and to kill unwanted fish in lakes.
11.	Dioxins	i. Unintentionally produced during most forms of combustion, including burning of municipal and medical wastes, backyard burning of trash, and industrial processes.
12.	Furans	i. Also can be found as trace contaminants in certain herbicides, wood preservatives, and in PCB mixtures.

Source: Http://Chm.pops.int/Theconvention/Thepops/The12initialpops/Tabid/296/Default.aspx Accesed on 7th May 2018.

Initially the convention recognised only twelve POPs (Popularly called as "The Dirty Dozens") for their adverse effects on human health and the environment. The convention placed a global ban on these particularly harmful and toxic compounds; and requiring its parties to take measures to eliminate or reduce the release of POPs in the environment are given in the **Table 2.2**.

Table 2.2: List of POPs Scheduled for Eliminiation/Restriction on Use

Substances Scheduled for Elimination	Substances Scheduled for Restrictions on Use	Substances Unintentionally Produced for Schedule for Reduction and Ultimately for Elimination
Hexachlorobenzene, Toxaphene, Chlordane, Aldrin, DDT, Mirex, Dieldrin, Endrin, Heptachlor, Hexabrombifenyl, Chlordecone, Polychlorinated biphenyls	DDT Hexachlorocyclohexane Polychlorinated biphenyls	Polycyclic aromatic hydrocarbons (PAH) Dioxins/Furans Hexachlorobenzene

2.3.2 The Basel Convention

The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their disposal was adopted on 22nd March 1989 by the Conference of Plenipotentiaries (COPs) in Basel, Switzerland and came into force in 1992. This convention is in response to a public outcry following the discovery that in Africa (1980) and other parts of the developing world, toxic wastes were imported from abroad.

Awakening environmental awareness and corresponding stringent environmental regulations in the industrialised world during 1970s to 1980s had led to increasing public resistance to the disposal of hazardous wastes – in accordance with what became known as the NIMBY (Not in My Back Yard) syndrome – and to an escalation of disposal costs. This in turn led some operators to seek poor disposal options for hazardous wastes in Eastern Europe and in the developing world, where environmental awareness was much less developed and lack of regulations and enforcement mechanisms. It was against this background that the Basel Convention was negotiated in the late 1980s the time of its adoption was to combat the "toxic trade", as it was termed.

Objective of Basel Convention - To protect human health and the environment against the adverse effects of hazardous wastes.

You have already read about this in the Unit 26, Block 3, BHM-102. The provisions of the convention centres around the following principles as mentioned in **Box 2.2**.

The reduction of hazardous waste generation and the promotion of environmentally sound management of hazardous wastes, wherever the place of disposal.

The restriction of transboundary movements of hazardous waste except where it is perceived to be in accordance with the principles of environmentally sound management.

A regulatory system applicable where transboundary movements are permissible.

Box 2.2: Principles on which the Basel Convention Provisions are based

Check Your Progress 2

Fill in in the blanks:

1. The convention that regulates the transboundary movement of hazardous waste is _____
2. The _____convention aims at reductions of harmful effects of persistent organic pollutants (POPs)
3. Two important POPs among the dirty dozen that are generated during burning of plastic waste which has harmful effects on human health are _____ and _____

2.4 NATIONAL LAWS

National laws are framed keeping in view the commitments and the treaties signed to the International Conventions and the regulatory principles that

govern management of health care waste. Each country may have different policies and legislations. In this section, National laws in India are discussed in detail for understanding how a country needs to look at waste management in the context of environment protection. **List of national Acts, regulations and guielines, applicable in India for management of health care waste by the HCFs and CBMWTFs are given in Table 2.3.**

Table 2.3: National laws, regulations, and guidelines applicable for management of bio-medical waste by the HCFs and CBMWTF (In India)

Acts/Rules/Guidelines		Issued by	Year of Issue
Acts	The Water (Prevention & Control of Pollution) Act	GOI	1974
	The Air (Prevention & Control of Pollution) Act	GOI	1981
	Environment (Protection) Act	MoEF& CC	1986
Regulations	EIA (Environment Impact Assessment) Notification	GoI	1995 and 2006
	Bio-Medical Waste (Management & Handling) Rules and as amended	MOEF	1998, 2000 and 2003
	Bio-Medical Waste Management Rules and as amended	MoEF& CC	2016 and 2018
Technical Guidelines	Guidelines for Common Bio-Medical Waste Treatment Facilities	CPCB	2003
	Guidelines on "Design & Construction of Bio-Medical Waste Incinerator"	CPCB	2003
	Guidelines for disposal of Bio-medical waste generated during Universal Immunisation Programme	CPCB	2004
	Guidelines on safe disposal of Used Needles and Syringes in the Context of Targeted Intervention for Injecting Drug Users	NACO	2009
	Environmentally Sound Management of Mercury Waste Generated from the Health Care Facilities	CPCB	2012
	Revised Guidelines for "Common Bio-Medical Waste Treatment Facilities"	CPCB	2016
	Guidelines for Bio-Medical Waste Incinerator (Revised Draft)	CPCB	2017
	Guidelines for Bar Code System for Effective Management of Bio-Medical Waste	CPCB	2018

Various rules that govern the management of other waste generated in the health care facility in case of India is given in **Table 2.4.**

Table 2.4: Rules that govern the management of other waste generated from health care facility in India

Sl. No.	Type of Waste	Covered Under
1.	Radioactive waste	Atomic Energy Act, 1962 (33 of 1962) and the Rules made there under of the Act.
2.	Hazardous Chemicals	The Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 made under the Act
3.	Solid wastes Rules	The Solid Waste (Management & Handling) 2000 and Solid Waste Managemnet Rules, 2016 made under the Act
4.	Lead Acid Batteries	The Batteries (Management and Handling) Rules, 2001 as amended made under the Act
5.	Hazardous wastes	The Hazardous Wastes (Management & Handling) Rules, 1998 The Hazardous Wastes (Management & Handling) (Amendment) Rules, 2000, 2003 The Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 and as amended made under the Act Hazardous and Other Waste (Management & Transboudary Movement) Rules, 2016 as amended under the Act
6.	E- waste	The e-Waste (Management and Handling) Rules, 2011 and e-Waste (Management) Rules, 2016 as amended made under the Act
7.	Hazardous microorganisms, genetically engineered microorganisms and cells	The Manufacture, use, Import, Export and Storage of Hazardous Microorganisms, Genetically Engineered Microorganisms or Cells Rules, 1989 made under the Act
8.	Plastic waste	Recyclable Plastics and Manaufacturing Rules,1999 and Plastic Waste Management Rules, 2011, 2016 and 2018

Check Your Progress 3

Fill in the blanks.

1. Environment (Protection) Act was notified in the year _____

2. Bio-Medical Waste Management Rules, 2016 is notified under the _____act.

2.4.1 Evolution of Environment Related Laws in India

Environmental protection has been the focus not only today but also from Vedic times as well. Though early period of British rule did not focus more on environmental laws, alter part did have some legislations in place. Some of the acts passed during the British rule in India are mentioned in **Fig. 2.1**.

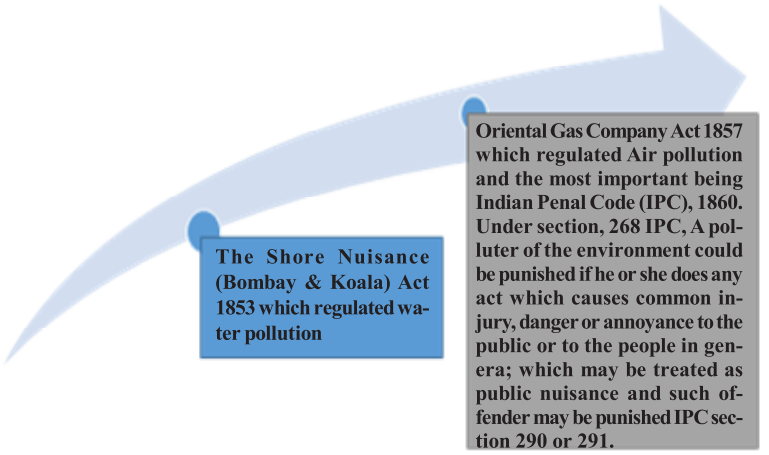


Fig. 2.1: Acts passed during the British rule in India

Post-independence there were several laws either directly or indirectly in the interest of protecting the environment which are mentioned in **Fig. 2.2**.

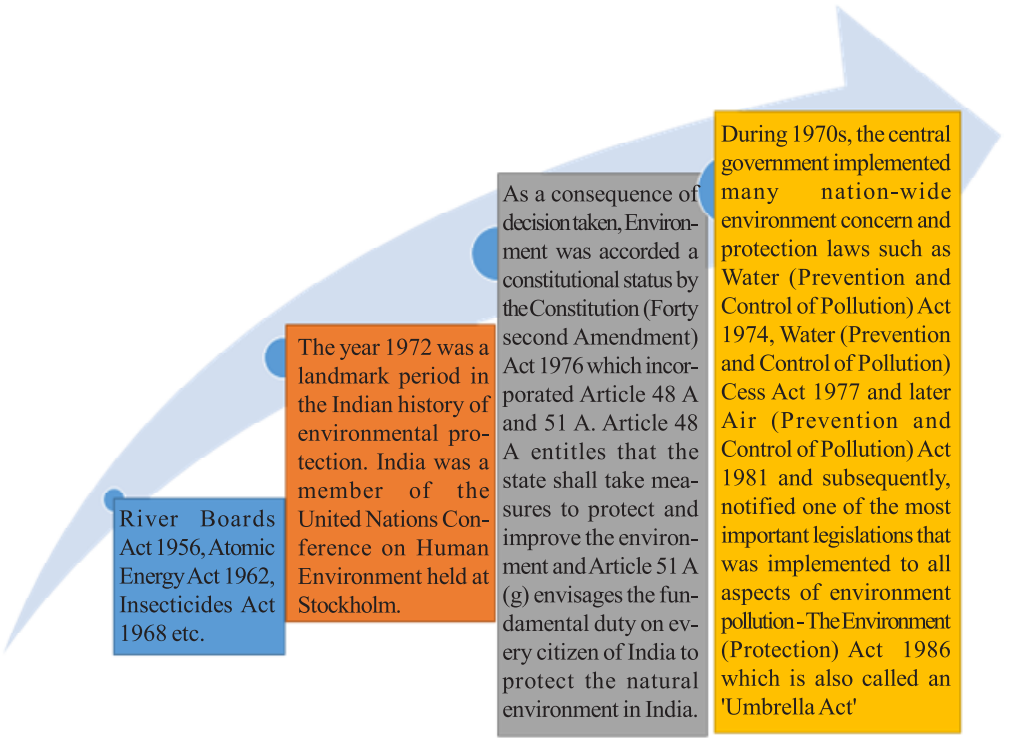


Fig. 2.2: Laws made post independence in India

2.4.2 The Environment (Protection) Act, 1986

As per the decisions taken in United Nations Conference on the Human Environment held at Stockholm in June, 1972, India agreed to take up appropriate measures for the protection and improvement of the environment. Accordingly, Environment (Protection) Act (EPA) came into force on 23rd March 1986. This act confers powers to the central government to regulate all forms of waste. It is one of the primary legislation to protect the environment and regulation of wastes.

Apart from Section 6, 8 and 25 which confers the government to frame legislations that are required to protect the environment, there are few other sections which are pertinent from health care waste management perspective **(Box 2.3)**.

a. Section 7 of this Act places a principal prohibition on harming the environment by stating that no person carrying any activity should emit or discharge environmental pollutants in excess of the prescribed standards.

b. Section 9 of the Act states that if any event takes place which harms the environment through any foreseen or unforeseen event, the person responsible for the harm is duty bound to prevent or alleviate the pollutant, discharged as a result of such event. The person is also obliged to inform the proper authorities about the event which may harm the environment.

c. Section 9 (3) of the Act embodies the "Polluter Pays Principle"which states that any expense which has been incurred to restore the environment to its natural state shall be paid by the person who is responsible for such degradation.

Box 2.3: Sections of Environment (Protection) Act 1986, pertinent for HCWM?

2.4.3 Evolution of Bio-Medical Waste Management Rules in India

You have already read in brief about the evolution of Bio-Medical Waste Management Rules in India. The chronological events are again provided in **Fig. 2.3**.

a. The Environment (Protection) Act, 1986 makes provision to issue any rules and notifications.

b. In 1989, the Government of India, in exercise of powers conferred under the section 6, 8 and 25 of Environment (P) Act, 1986 , formulated the Hazardous Waste (Management and Handling) Rules 1989 however, these rules did not cover health care waste despite India being party to Basel Convention on transboundary movement of Hazardous waste . Meanwhile, raising awareness among the community brought about many writ petitions and public interest litigations filed in relation to hospital waste.

c. Framing of Bio-Medical Waste Management Rules in India came as a result of landmark judgement by Hon'ble Supreme Court on 1st March 1996 with regard to safe disposal of infectious hospital waste. The court ordered that all hospitals with 50 beds and above should install their own incinerators or an equally effective alternative method before 30th November 1996 and the incinerators should be installed with necessary pollution control mechanism conforming to the standards laid down by the Central Pollution Control Board. Infectious hazardous medical waste should be segregated at source and disinfected before final disposal.

d. Subsequently, Ministry of Environment and Forests Government of India notified the draft Bio-medical Waste (Management and Handling) Rules 1995 n 24th April 1995 vide Gazette of India and were invited for public comments for any objections.

e. Further, the Ministry of Environment & Forest, Government of India notified Bio-Medical Waste (Management and Handling) Rules, 1998 in exercise of powers conferred by section 6,8 and 25 of the Environment (Protection)Act , 1986, published in The Gazette of India Extraordinary, part –II, section-3- sub section (ii), New Delhi, July 27, 1998.

In order to implement these rules more effectively and to ensure segregation, collection, processing, treatment and disposal of bio-medical waste in an environmentally sound manner, the central government reviewed the existing rules. Accordingly, in exercise of powers conferred by section 6,8 and 25 of the Environment (Protection) Act, 1986, the Bio-Medical Waste Management Rules, 2016 came into force with effect from 28th March, 2016 in supersession of the Bio-Medical Waste (Management and Handling) Rules, 1998. Amendments to the BMWM Rules 2016 was notified by Gazette notification on 16th March 2018 as Bio-Medical Waste Management (Amendments) Rules, 2018.

Fig. 2.3: Evolution of Bio-Medical Waste Management Rules in India

2.4.4 Salient Features of BMWM Rules, 2016 for as amended Ensuring Safe Management of Bio-Medical Waste

Salient features of BMWM Rules, 2016 for ensuring safe management of Bio-medical waste are mentioned in **Box. 2.4A** .

Did you know?

It may be noted that there is no perfect or ideal method of waste management, each technology has advantages and disadvantages.

a. **The ambit of the rules has been expanded to include** camps such as vaccination camps, blood donation camps, surgical camps or any other health care activity irrespective of the quantum of waste generated and treatment services offered. Therefore, all health care facilities (bedded or non-bedded as well as AYUSH Hospitals fall under the ambit of the BMWM Rules, 2016, as amended)

b. **Procedure to get authorisation simplified**. All the bedded hospitals requires consents under Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981 and authorisation under the BMWM Rules, 2016, as amended. **One time Authorisation for Non-bedded HCFs**

c. **Pre-treatment** of the laboratory waste, microbiological waste, blood samples and blood bags through disinfection or sterilisation on-site in the manner as prescribed under the rules

d. **Training** to all health care workers and **immunisation of** all health workers regularly

e. **Establishing Bar-Code System for bags or containers** containing bio-medical waste for safe disposal

f. Reporting of major accidents

g. **Existing incinerators to achieve the standards for retention time in secondary chamber and Dioxin and Furans within two years**

h. Bio-Medical waste has been classified into **4 categories instead of 10** to improve the segregation of waste at source

i. **Inclusion of emissions limits for mercury as well as dioxin and furans in addition to the general parameters**

j. State Government to provide land for setting up common bio-medical waste treatment and disposal facility

k. **No occupier shall establish on-site treatment and disposal facility,** if a service of common treatment facility is available within a **distance of seventy-five kilometre**

l. Operator of a Common Bio-Medical Waste Treatment and Disposal Facility to ensure the timely collection of bio-medical waste from the HCFs and assist the HCFs in conduct of training

Box 2.4 A: Salient features of BMWM Rules, 2016 for ensuring safe management of bio-medical waste

Salient features of the BMWM Rules, 2016 may also be referred in Unit 14, Block 4, BHM-101.

Salient features of Bio-Medical Waste Management (Amendment) Rules, 2018 are given in **Box 2.4 B**.

Sl. No.	Salient Features
1.	All Health care facilities should phase out chlorinated plastic bags (excluding blood bags) and gloves by March 27, 2019. Till the standards are published, the carry bags shall be as per Plastic Waste Management Rules, 2016
2.	All HCFs shall need to make available its annual report on its website within two years from the date of publication of the amended rules
3.	Operators of CBMWTF should establish bar coding and Global positioning system (GPS) for handling of waste as per guidelines issued by CBCB by March 27, 2019
4.	The prescribed authority have to compile, review, analyse the information received and send the information to CPCB in the new Form-IV A. This seeks detailed information regarding district-wise bio-medical waste generation, information on Health Care Facilities having captive or own treatment facilities, information on common bio-medical waste treatment and disposal facilities.
5.	Every occupier shall pre-treat the lab waste, microbiological waste, blood samples and blood bags through disinfection or sterilisation on-site in the manner as prescribed by the WHO guidelines on safe management of health care activities and WHO blue book 2014 and then send to CBMWTF for final disposal

Box 2.4 B: Salient features of Bio-Medical Waste Management (Amendment) Rules, 2018

Check You Progress 4

State true or false, and correct the statement if false

1. Bio-Medical Waste Management Rules, 2016 is notified under the Environment (Protection) Act, 1986
2. Outreach camps do not come under the ambit of BMWM Rules, 2016
3. Non bedded health care facilities are exempted from authorisation under BMWM Rules, 2016
4. Laboratory waste, microbiological waste, blood samples and blood bags should be pre-treated at health care facility level.
5. All occupier have a responsibility to establish waste treatment and disposal facility within their hospital.

2.5 LEGAL ASPECTS FOR EFFECTIVE IMPLEMENTATION OF BIO-MEDICAL WASTE MANAGEMENT RULES

The Bio-Medical Waste Management Rules, 2016 and amendments made thereof applies to all those who generate, collect, receive, store, transport, treat, dispose or handle bio-medical waste in any form. It includes all types of health care facilities such as hospitals, nursing homes, clinics, dispensaries, veterinary institutions including pathological laboratories, blood banks, AYUSH hospitals, clinical establishment, research or educational institutions, forensic laboratories and research labs. The scope of the rules extend to the health camps, medical or surgical camps, vaccination camps, blood donation camps also. In India, the term bio-medical waste is used to describe the health care waste.

2.5.1 Authorisation

Authorisation means permission granted by the prescribed authority i.e., State Pollution Control Board (SPCB) in States or Pollution Control Committees (PCCs) in Union Territories or Director General of Armed Forces Medical Services in case of Armed Forces Health Care Establishments, for generation, collection, transportation, treatment and disposal. **Box 2.5 Gives details of obtaining authorisation.**

a. Who has to apply and how to apply?

i. Every occupier (bedded HCFs) or operator handling waste irrespective of the quantity of waste generated or handled shall make an application in Form-II for obtaining authorisation under BMWM Rules, 2016 and its validity is granted in line with the validity of Consent under Water Act, 1974 and Air Act, 1981

ii. For non-bedded health care facilities, one time authorisation needs to be obtained. Application should be submitted to the respective State Pollution Control Board (SPCB) or Pollution Control Committee (PCC) in Union Territories or DGAFMS

b. Prescribed authority that grants the authorisation

State Pollution Control Board (SPCBs) in States, Pollution Control Committees (PCCs) in Union Territories and Director General of Armed Forces Medical Services (DGAFMS) in case of Armed Forces Health Care Establishments, for generation, collection, transportation, treatment and disposal.

c. Grant of authorisation

The prescribed authority will grant the authorisation in the Form-III and the validity of such authorisation for bedded health care facilities shall be synchronised with the validity of the consents (Air and water act) .The authorisation for non-bedded occupiers shall be one time and it shall be deemed to have been granted, if not objected by the prescribed authority within a period of ninety days from the date of receipt of duly completed application along with necessary documents.

In case of any change in the activity of a HCF or bio-medical waste generation, handling, treatment and disposal for which authorisation was earlier granted, the occupier or operator shall intimate to the prescribed authority about the change or variation in the activity and shall submit a fresh application in Form-II for modification of the conditions of authorisation.

d. How to fill the application?

Application to be made in Form-I

Information required for application:

i. Particulars of application, address, contact details etc

ii. Validity of consents under Water (Prevention and Control of Pollution) Act, 1974 and Air (Prevention and Control of Pollution) Act, 1981

iii. Details of HCF - No. of beds , average number of patients treated per month

iv. Quantity of waste generated or disposed by the health care facility (HCF)

Did You know?

Online application can be submitted if the prescribed authority has made provisions for it.

v. Details of any treatment facility available in the premises of HCF

e. Other relevant documents that need to be enclosed as per each prescribed authority are

i. Location plan of hospital

ii. Copy of agreement with CBMWTF

iii. Self-certification regarding bed capacity

iv. Liquid waste management procedure

v. Ownership proof

vi. Copy of manifest for last 15 days

vii. Compliance report of previous authorisation

f. Validity of authorisation

i. For bedded HCFs

The validity is synchronised with the validity of consents granted under Water and Air Acts

a. Consent under Water (Prevention and Control of Pollution) Act, 1974

b. Consent under Air (Prevention and Control of Pollution) Act, 1981

ii. For non-bedded HCFs

a. The authorisation for non-bedded occupiers shall be one time

b. Fresh authorisation needs to applied for if there is any change or any variance in relation to the activities for which the authorisation was granted by the respective State Pollution Control Board (SPCB)/ Pollution Control Committee (PCC) or DGAFMS

g. Period of processing the application

Every application for authorisation shall be disposed of by the prescribed authority within a period of ninety days from the date of receipt of the duly completed application along with such necessary documents, failing which it shall be deemed that the authorisation is granted under the Bio-Medical Waste Management Rules, 2016, as amended.

h. Refusal of authorisation

In case of refusal of renewal, cancellation or suspension of the authorisation by the prescribed authority, the reasons shall be recorded in writing. However, the prescribed authority i.e. SPCB/PCC or DGAFMS will give an opportunity to the applicant of being heard before such refusal of the authorisation.

Box 2.5: Details of authorisation under the BMWM Rules 2016, as amended

Flow chart for Process of authorisation is given in **Fig. 2.4**.

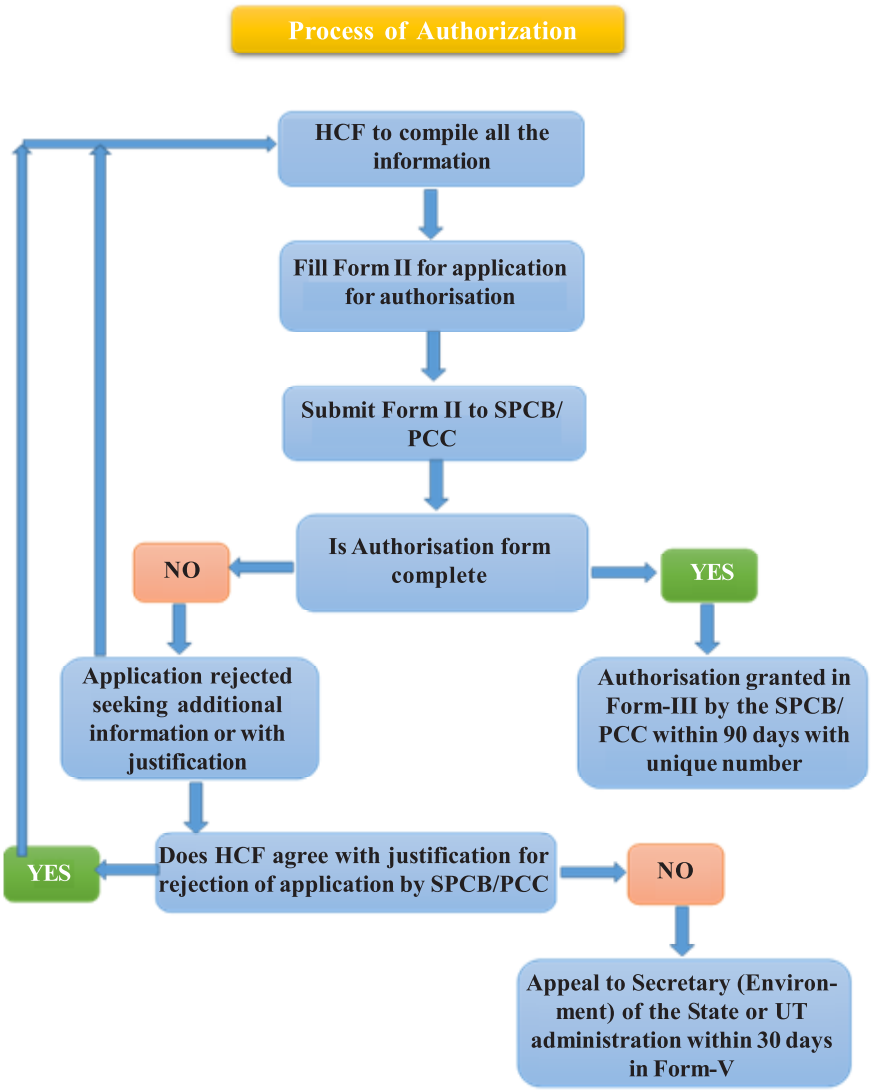


Fig. 2.4: Flow chart for obtaining of authorisation under BMWM Rules, 2016, as amended

Source: Implementation Guidelines for Environmentally Sound Management of Waste Generated from Health Care Facilities issued jointly by MoH& FW, MoEF& CC and CPCB.

2.5.2 Maintenance of Records

Let us now read about the records that need to be maintainedin compliance with the BMWM Rules 2016, as amended **(Box 2.6)**.

Every authorised person shall maintain records related to:

a. Generation - Quantum of different types of waste generated

b. Collection and transportation to storage area and from there to CBMWTF - Bar coding of the waste

c. Storage area - Capacity, quantum of waste stored and sent to CBMWTF everyday based on bar code data base system

d. Pre-treatment methods - Autoclaving/ hydroclaving or microwaving process. Temperature/ pressure and efficacy achieved during each cycle

e. Any treatment and disposal methods - Quantum of waste disposed in Deep burial, and sharps pit and quantum of plastic waste handed over to registered recycler in health care facilities not connected to CBMWTF

f. Training reports

g. Immunisation records of all the health care workers

h. Health checks of the health care workers

i. Needlestick injuries or any accidents occurred and the remedial measures taken

j. minutes of meeting of **Bio-Medical Waste Management** committee

i. Period of retention: All the records should be retained for a period of five years

ii. Power of scrutiny: All the records shall be subject to inspection and verification by the prescribed authority or the Ministry of Environment, Forest and Climate Change at any time

Box 2.6: Record maintenance in compliance with the BMWM Rules, 2016 as amended

2.5.3 Annual Report Submission

Let us see the guidelines for preparation and submission of annual report in **Box 2.7**.

a. The annual report is for the period of January to December of preceding year.

b. The Annual Reports shall also be available online on the websites of Occupiers, State Pollution Control boards and CPCB.

Box 2.7: Guidelines for preparation and submission of Annual Report

Details of time limit for submission of annual report is given in **Table 2.3**.

Table 2.3: Time limits for submission of annual reports

Annual Reports	Form to be Used	Deadline of Submission
i. Annual report from HCF/ facility to the prescribed authority (SPCB/ PCC)	Form-IV	30th June of every year
ii. Annual report from SPCB/ PCC to CPCB	Form-IV A	31st of July of every year
iii. Annual report from CPCB to MoEF&CC	-	31st August of every year

Placed in the **Box 2.8** are the details that must be available in the annual report submitted by the respective HCF's and the SPCB/ PCC and DGAFMS.

I Annual report from HCF/ Operator to the prescribed authority (SPCB/ PCC) :

a. Every occupier should submit an annual report to the prescribed authority in Form-IV on or before the 30th June of every year

b. Every health care facility need to display their annual report on its website within two years of notification of amended rules i.e. by March 2020.

c. Details that should be provided in the Annual report (Form-IV)

i. Particulars of HCF /Occupier

ii. Quantity of waste generated (kg/year)

iii. Details of on-site storage, treatment, transportation, processing and disposal facility

iv. Details of accidents that occurred in the last one year

v. Liquid waste generated and the treatment system in place

In addition, the following needs to be enclosed

vi. Minutes of meeting of the committee

vii. Details of training conducted on bio-medical waste management

viii. Records of effluents generated and its characteristics

ix. Records of pre-treatment of specified waste

x. Records of recyclable waste handed over to authorised recycler (Where captive or own treatment and disposal facility is allowed by the SPCB/PCC)

xi. Details of accidents during last one year along with remedial steps taken

II Annual report from the prescribed authority (SPCB/ PCC and DGAFMS-Director General of Armed Forces Medical Services) to CPCB:

a. The prescribed authority shall compile, review and analyse the information received and send the information to CPCB in Form-IV A before the July 31st of every year

b. Display the report on its website

c. Some of the details to be compiled in Form-IV A

i. District-wise bio-medical waste generation by bedded and non-bedded HCFs

ii. Status of authorisation

iii. Information on Health Care Facilities having captive treatment facilities

iv. Information on common bio-medical waste treatment and disposal facilities

v. Total number of violations

vi. Details of show cause/directions issued

III Annual report from the prescribed authority (SPCB/ PCC) to CPCB:

a. The CPCB shall compile, review and analyse the information received and send the information to CPCB in Form-IV A before the 31st August of every year

b. Display the report on CPCB website

Box 2.8: Details to be submitted in Annual Report

2.5.4 Accident Reporting

Any accident that occurs during the handling of bio-medical waste management has potential to harm either human health or environment. Accidents can be classified

as Major and Minor accidents. Some examples have been given in the **Box 2.9**.

Major Accidents	Minor Accidents
i. Toppling of truck carrying bio-medical waste	i. Needlestick Injuries
ii. Fire hazard	ii. Blood or body fluid Spills
iii. Accident release of bio-medical waste into water body	iii. Blood or body fluid Splash
iv. Blasts	
v. Flooding or erosion of deep burial	

Box 2.9: Examples of major and minor accidents

In an event of any major accidents, it is mandatory that the authorised person should take necessary remedial measures. He/ she should immediately intimate to the prescribed authority about such accident. The accident report should be forwarded to SPCB/PCC **within twenty fours** of accident regarding the remedial steps including that of preventive and corrective action taken. The report should done on the prescribed **Form-I** given in BMWM Rules, 2016, as amended.

Minor accidents or incidents need to be reported immediately but the HCF to record the same in HCF and necessary remedial steps taken should be included in the annual report in accordance with Rule 13 by the occupier.

Details regarding accident in the annual report that needs to be included:

i. Total number major and minor accidents

ii. Number of people affected

iii. Remedial actions taken

2.5.5 Monitoring and Review

Every HCF must ensure that there is system of monitoring and review of bio-medical waste management systems.

Monitoring and review is stipulated at all levels by the BMWM Rules, 2016, as amended.

State Level	State Monitoring Cum Technical Advisory Committee
District level	**District Monitoring Cum Technical Advisory Committee**
HCFs with more than 30 beds	**Hospital Infection Control Committee (HICC)/ Bio-Medical Waste Management Committee/Quality Team**
HCFs with less than 30 beds	**Designated Bio-Medical Waste Management Officer/ Supervisor**

Check Your Progress 5

Fill in the blanks.

1. The prescribed authority that grants authorisation in states is .....
2. Health care facilities having more than ..... beds need to have a waste management or infection control committee.

3. Authorisation shall be seemed to have been granted to non-bedded HCFs if there is no objection by the prescribed authority within a period of ..... days.
4. Date by which the annual report from HCF should be submitted to the prescribed authority is ..... of every year.
5. Major accidents have to be reported to SPCB within ..... hours of the occurrence of the event.

2.6 VIOLATIONS AND PENALTIES

Let us first look into the common violations. We shall then study the common penalties under the BMWM Rules, 2016, as amended.

2.6.1 Common Violations

The common violations as observed in the health care facilities are given in **Box 2.10**.

Common violations observed in HCFs are as follows:
a. Improper colour coded containers and mismatch plastic bags
b. Not following correct segregation practices as per Schedule-I
c. Bags and containers without biohazard or cytotoxic symbol as appropriate
d. No pre-treatment being done
e. Mixing of bio-medical waste with general waste
f. Disposal of bio-medical waste in the vicinity or the premises of the hospital compound of the premises
g. No treatment of liquid waste
h. Transportation of bio-medical waste in a non-designated vehicle
i. Sale of plastic to unauthorised recycler
j. No proper storage area
k. Storage of untreated waste beyond 48 hours
l. Mixing of waste at storage area
m. Handling of waste without PPE
n. Transporting bio-medical waste along with general waste

Box 2.10: Common violations as observed in the health care facilities

2.6.2 Actions by Prescribed Authority in Event of Violations by HCF

As per Bio-Medical Waste Management Rules, 2016, as amended, the occupier of the HCF is liable for any damage caused to the environment of public due to improper handling of bio-medical waste. The occupier is liable for actions under the provision of Section 5 and Section 15 of the Environment (Protection) Act, 1986.

Penalties under Section 5 of the Environment (Protection) Act, 1986

For any violations, the central government or CPCB/SPCB/PCC as empowered by MoEF & CC may issue directions in writing to any person, officer or any authority to the extent of :

a. the closure, prohibition or regulation of any industry, operation or process; or

b. stoppage or regulation of the supply of electricity or water or any other service.

In case of failure or contravention, Penalties under the Section 15 of the Environment (Protection) Act, 1986

a. Imprisonment for a term which may extend to five years or fine up to one lakh rupees, or Both

b. In case the violation continues, additional fine may extend to five thousand rupees for every day after the conviction for the first such failure or contravention

c. If the failure or contravention continues beyond a period of one year after the date of contravention, the offender shall be punishable with imprisonment for a term which may extend to seven years

Box 2.11: Penalties for non-compliance with BMWM Rules, 2016, as amended

2.6.3 Appeal

Details of who can appeal, how to appeal and whom to appeal and when to appeal are mentioned in **Box. 2.12**.

a. Who can Appeal?

Any person aggrieved by an order can file the appeal made by the prescribed authority under the BMWM Rules, 2016, as amended

b. How to Appeal?

a. Appeal can be filed through filing the Form -V

b. Details of the appellant and the grounds on which the appeal is made should be explained. Certified copy of the order against which the appeal is made and the necessary supporting documents should be enclosed

c. Whom to appeal to?

a. HCF/CBMWTF or any aggrieved personal shall appeal against the orders of SPCB/PCC to the Secretary (Environment) of the state Government or Union Territory administration

b. AFHCE or any aggrieved armed forces medical services personal shall appeal against the order of the Director General of Armed Forces Medical Services), to the Secretary, Ministry of Environment, Forest and Climate Change (MoEF&CC)

d. When to appeal?

a. Appeal should be filed within the period of thirty days from the date on which the order is communicated to him/her

b. However, the authorities - Secretary (Environment) of the State

Government or Union territory administration or Secretary, MoEF&CC may entertain the appeal even after the expiry of thirty days, if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal in time

c. The appeal shall be disposed of within a period of ninety days from the date of its filing

Box 2.12: Provisions of appeal under the BMWM Rules 2016, as amended

Check Your Progress 6

Match the following

1. FORM - I	A. Annual Report from HCF to SPCB/PCC
2. FORM - II	B. Accident reporting
3. FORM - III	C. Application for filing appeal against order passed by the prescribed authority
4. FORM - IV	D. Annual Report from SPCB/PCC to CPCB
5. FORM - IV A	E. Granting Authorisation to HCF by SPCB/PCC
6. FORM -V	F. Application for authorisation or renewal of authorisation

2.7 FREQUENTLY ASKED QUESTIONS (FAQS) BY THE HCFS

1. In an HCF, who is responsible to apply for authorisation?

As defined in the BMWM Rules, 2016, as amended, the occupier who has an administrative role in a HCF is responsible for obtaining for authorisation. He or she may designate a nodal person/ waste manager or any responsible person to do all the formalities on his or her behalf.

2. Can I have my own treatment facility in a HCF premises instead of handing over all the generated bio-medical waste to CBMWTF?

No. If your HCF is situated within the reach of 75 kms of CBMWTF(s), you must have a valid agreement with CBMWTF and hand over all the generated bio-medical waste to the CBMWTF only. Only in an event the HCF is not within the 75 kms, the HCF can establish the captive treatment and disposal facility only after obtaining of authorisation under the BMWM Rules, 2016, as amended from the concerned prescribed authority.

3. How do I dispose the dead foetus?

Dead foetus should be handed over to a CBMWTF in a properly labelled Yellow bag (tied) with a copy of the Medical Termination of Pregnancy (MTP) certificate from the Obstetrician or the Medical Superintendent or the CMO of the hospital. In case of HCFs without linkage to CBMWTF, the dead foetus should be disposed in deep burial as authorised by the respective SPCB/PCC.

4. How do enter into agreement with CBMWTF?

As a HCF you need to have a valid agreement with the CBMWTF (authorised by the respective SPCB/PCC and having validity of authorisation) located within 75 kms for treatment and disposal of

Bio-medical waste generated in the Health Care Facility. You need to ensure that the waste (including pre-treated waste as required under BMWM Rules, 2016, as amended) is collected by the CBMWTFwithin specified period which should not extend beyond 48 hours. Agreement should specify the responsibilities of the agreement parties and payment conditions and also the terms of supply of non-chlorinated plastic bags and the bar code system for waste collection on daily basis as well as collection, transportation, treatment and disposal of waste within 48 hours.

5. **Why should I pay for handing over the bio-medical waste to CBMWTF?**

   As polluter pay principle, the one who generates waste has to pay to the CBMWTF to manage the waste safely.

6. **What should I do if the stored waste is not collected regularly by the CBMWTF?**

   It is the responsibility of the Occupier to ensure that the CBMWTF collects the waste regularly preferable daily or at least on alternate days such that that waste is not stored beyond 48 hours. If the waste is not collected regularly by the CBMWTF, the same should be discussed with the operator of the facility and rectify if there are any minor problems. But if the same continues, it shall be the duty of the occupier of HCF to notify to the respective SPCB or PCC about any such lapse. The HCF should mandatorily report if the waste is stored beyond 48 hours and the reasons for the same and shall take all remedial actions to ensure that the waste does not adversely affect the human health or environment.

7. **Where do I get non chlorinated plastic bags for collection of bio-medical waste?**

   Usually the non-chlorinated plastic bags are provided by the CBMWTF. The same can be mentioned as part of their agreement.

8. **Does the SPCB/PCC have powers to enter my premises and inspect any time without my permission?**

   The prescribed authority can enter and inspect the premises at any time without the permission to check for compliance and any deviations.

9. **If violations is found in my premises, am I penalised immediately?**

   The occupier is given show cause notice for violating the provisions with an opportunity of personal hearing as per competency depending on the violations. Action can be initiated by the prescribed authority for closure of a HCF depending on the severity of violations.

2.8 CASE STUDIES

Case study 1

One of the private chain hospital in Mohali after hearing was imposed a fine of Rupees 10 lakhs by Punjab Pollution Control Board in February 2018 and also a bank guarantee of Rupees, 25 lakhs with it as an assurance to ensure compliance of BMWM Rules, 2016, as amended. The board earlier seized one ton of plastic bio-medical waste being delivered to local scrap dealer. The board directed the hospital to suspend the

housekeeping in-charge immediately and take action against him after an inquiry and also terminate the contract with solid waste lifting agency and to file a FIR against him.

The hospital claimed innocence and it was probably the miscreant act of the housekeeping in-charge and solid waste Collector.

1. Discuss if the PPCB was rightful in penalising the hospital for the fault of the housekeeping staff and the solid waste handler.
2. What was the violation in this case?
3. How could this be further prevented?

Case study 2

Order of the National Green Tribunal in the matter of Veterans Forum for Transparency in Public Life Vs. Department of Health and Family Welfare, Govt. of Bihar & Others dated 12/03/2018 regarding collection and disposal of bio-medical waste by a unit in Bihar. The Applicant (Veterans Forum for Transparency in Public Life) have sought enforcement/ compliance of the NGT order dated 24th October, 2017 requiring Central Pollution Control Board, State of Bihar and Bihar Pollution Control Board to prepare an inventory of the Unit generating bio-medical waste, its collection and disposal as to whether it is being done in accordance with Bio-Medical Waste Management Rules, 2016. But all the three Respondents have failed to file the report.

NGT directs issuance of notice of show cause as to why, apart from taking such penal action as permissible under provision of the National Green Tribunal Act, 2010, environmental compensation shall not be imposed as the adverse impact is relatable directly to their inaction.

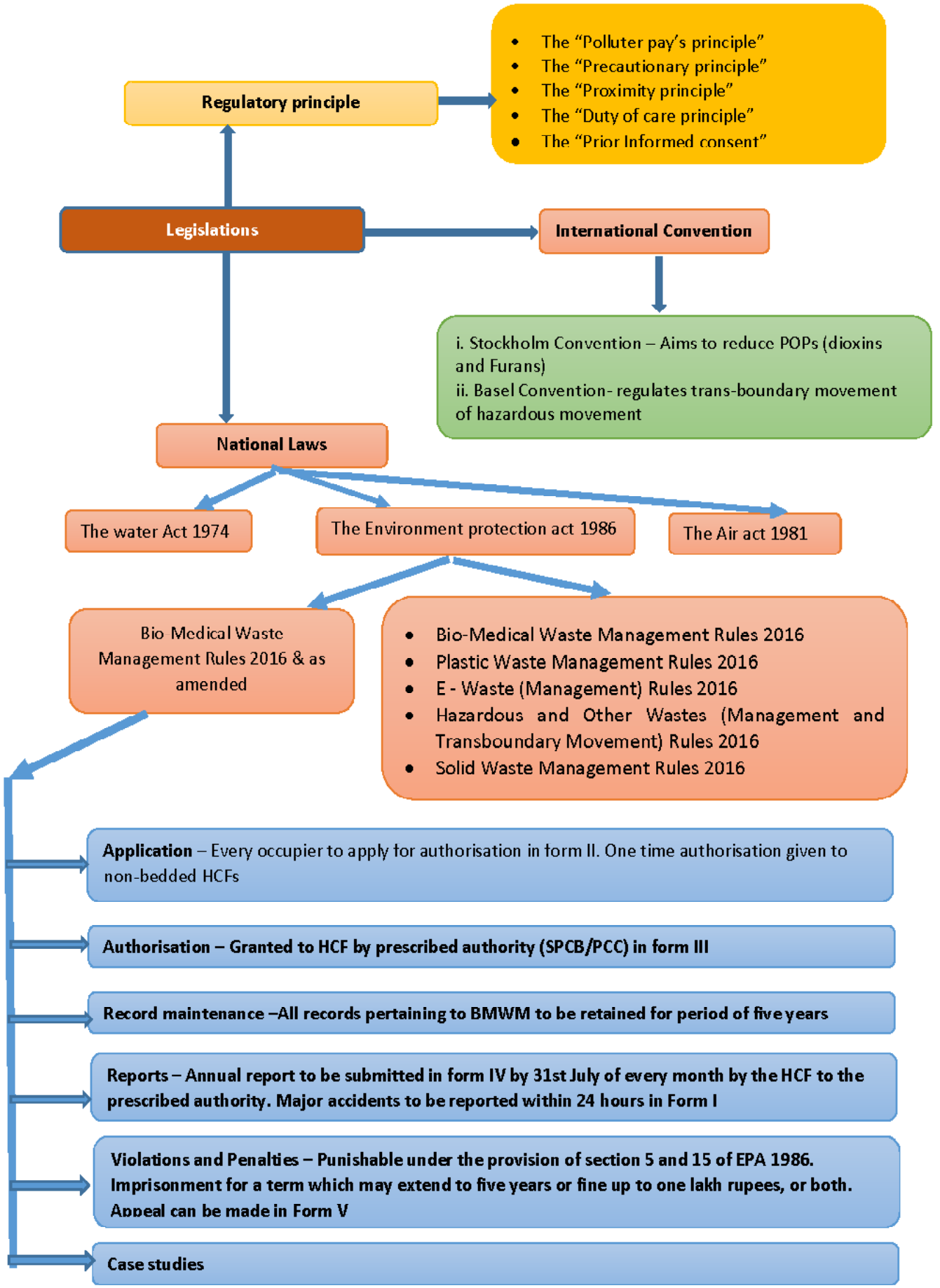
Source: http://www.indiaenvironmentportal.org.in/content/452765/order-of-the-national-green-tribunal-regarding-management-of-bio-medical-waste-bihar-12032018/accessed on 24/4/2018

Discussion: This case entitles National green tribunal to act against the monitoring agencies with respect to Bio-Medical Waste Management rules, 2016. So the central and state level monitoring authorities have equal responsible to ensure that sound management of bio-medical waste is ensured at their respective levels.

2.9 LET US SUM UP

In this unit, as an administrator of the hospital, we have learnt the legal requirements to be kept in mind. It is important to develop standard operating procedures, Policy and guidelines to be in place for effective implementation of for handling bio-medical waste with respect to occupational safety. It is important that all health care workers need to be communicated and trained regarding the standard operating procedures and precautions to be followed by them.

This unit has considered the legal aspects in the Indian context. The other countries having their own specific legal aspects have not been covered here. The details covered in this unit have been summarised in mind map (**Fig. 2.5**).


Regulatory principle
The "Polluter pay's principle"
The "Precautionary principle"
The "Proximity principle"
The "Duty of care principle"
The "Prior Informed consent"
Legislations
International Convention
i. Stockholm Convention – Aims to reduce POPs (dioxins and Furans)
ii. Basel Convention- regulates trans-boundary movement of hazardous movement
National Laws
The water Act 1974
The Environment protection act 1986
The Air act 1981
Bio Medical Waste Management Rules 2016 & as amended
Bio-Medical Waste Management Rules 2016
Plastic Waste Management Rules 2016
E - Waste (Management) Rules 2016
Hazardous and Other Wastes (Management and Transboundary Movement) Rules 2016
Solid Waste Management Rules 2016
Application – Every occupier to apply for authorisation in form II. One time authorisation given to non-bedded HCFs
Authorisation – Granted to HCF by prescribed authority (SPCB/PCC) in form III
Record maintenance –All records pertaining to BMWM to be retained for period of five years
Reports – Annual report to be submitted in form IV by 31st July of every month by the HCF to the prescribed authority. Major accidents to be reported within 24 hours in Form I
Violations and Penalties – Punishable under the provision of section 5 and 15 of EPA 1986. Imprisonment for a term which may extend to five years or fine up to one lakh rupees, or both. Appeal can be made in Form V
Case studies

2.10 GLOSSARY

BMWM Rules : Bio-Medical Waste Management Rules, 2016, as amended.

Authorisation : Document granting permission to HCF to generate, handle, transport, treat and dispose bio-medical waste.

Appeal : Apply to the higher authority for a reversal of decision taken by the lower body.

Consent : Obtain permission to do something such establish or operate a facility.

PPE : Personal Protective Equipment are specialised clothing or equipment worn by an employee which act as barriers or filters against infectious materials.

2.11 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1=e; 2= c; 3=d; 4= a; 5 b

Check Your Progress 2

1. Basel convention
2. Stockholm convention
3. Dioxins and Furans

Check Your Progress 3

1. 1986
2. Environment (Protection) Act, 1986

Check Your Progress 4

1. True
2. False

Outreach camps are covered under the ambit of BMWM rules 2016

3. False

   Non bedded health care facilities need to obtain one time authorisation

4. True
5. False

   No occupier shall establish an on-site treatment and disposal facility, if a service of common bio-medical waste treatment facility is available within a distance of seventy-five kilometre.

Check Your Progress 5

Fill in the blanks

1. State Pollution Control board of respective states
2. Thirty
3. Ninety
4. 30th June

5. Twenty four

Check Your Progress 6

1- B; 2- F; 3- E; 4- A; 5- D; 6 - C

2.12 REFERENCES AND FURTHER READINGS

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