

Ministry of Health

Department of Public Health

Occupational and Environmental Health Division

Guidelines on Health Care Waste Management for Health Care Facilities

This document is prepared under Health Care Waste Management Project implemented by Occupational and Environmental Health Division, Department of Public Health.

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Forward

A regional consultation of national representatives of health authorities of nine South East Asia Region countries including Myanmar and international experts on Sound Management of Hospital Waste was held in Chiang Mai, Thailand from 28th to 29th November 1996.¹ At a regional consultation reviewed a draft action plan to develop sound management program for hospital wastes. As an outcome Action Plan for the development of National Program for Sound Management of Hospital Wastes that intends to serve as a guide to countries of the region to develop or strengthen in a step-wise manner their national programs to manage hospital wastes in an environmentally sound manner was emerged. Since then Department of Health, Ministry of Health had committed to bring into view a national program with an assistance of that guide, Occupational Health Unit and Environmental Sanitation Unit were assigned as focal agencies in collaboration with key stakeholders like Yangon City Development Committee (YCDC), Mandalay City Development Committee (MCDC) and WHO.

In spite of stated as a national program, it had systematically and effectively implemented only at Yangon the capital city of Myanmar and the capital city of Upper Myanmar Mandalay as well organized municipal measures including solid waste management system are being established, an umbrella of hospital waste management. The program last about four years at Yangon unfortunately due to unavoidable circumstances but at Mandalay it had been sustained. Fortunately, in 2008 management of hospital wastes in environmentally sound manner resumed back its right place in broad spectrum with a new topic Health Care Waste management.

Myanmar moved towards Universal Health Coverage as stated in the legal framework of the new constitution enacted by the Republic of Union of Myanmar in May 2008, the Project Development Objective (PDO) of the first phase of World Bank Group support is to increase coverage of essential health services of adequate quality, with a

¹ Action Plan for the Development of National Programme for Sound Management of Hospital Wastes. An outcome of the Regional Consultation on Sound Management of Hospital Waste Chiang Mai, Thailand, 28-29 November 1996

focus on maternal, newborn and child health (MNCH). It is also known as Essential Health Services Access (EHSA) Project in Myanmar implemented by the Ministry of Health (MoH) and financed by the World Bank/IDA loan.

The Project components are

Component 1: Strengthening Service Delivery at the Primary Health Care Level

Component 2: Systems Strengthening, Capacity-building and Program Support

Component 3: Contingent Emergency Response²

Out of these three components Component 2: Systems Strengthening, Capacity-building and Program Support would focus on strengthening of systems and institutions that are needed for effective service delivery at the primary health care level. Systems strengthening will consist of the development of strategies, plans, SOPs, checklists and guidelines. One of the key outputs of this support is the preparation of health care waste management guidelines. The project may include only financing for small-scale rehabilitation of existing health care facilities within the same foot print or financial support for new health care equipment for primary care use (e.g., syringes, bags and bins for health care waste). Such support might generate minor temporary site-specific environment impacts (e.g. dust, noise) and/or contribute to increased health waste, which needs proper management and disposal.

In line with the National Comprehensive Development Plan (Health Sector) (2011-12 to 2030-31), the current policy and institutional reform in the health sector includes development of priority areas in seven programs including health system strengthening (policy and legislation; universal health coverage, and strengthening information health systems). Yet, the existing legislation does not adequately address issues of health care waste management. Also, coordination and supervision of health care wastes at all levels in the country is not clearly developed and needs further

² Myanmar Essential Health Services Access Project

strengthening while a National Action Plan should be implemented to manage practices at all levels in an integrated health system.

National legislation on the management of hazardous wastes - including other categories of hazardous wastes, such as pesticides, certain industrial wastes, etc., is not clearly developed and national guidelines for the management of medical wastes are still to be formulated to complement standards on clinical policies and procedures and to follow monitoring practices.

The safe management of biomedical and health care waste is essential for community health. In order to tackle solid waste management effectively, it is essential for all the stake holders including policy makers at Ministry of Health to pay special attention to sources of waste generation, segregation by type, coding, storage, transportation, treatment including pre-treatment, disposal of residues including flue emissions from incinerators, occupational health safety, stakeholder and community awareness.

In the meantime, regulatory, policy and administrative guidelines and framework for health care waste management exist to smaller extent in written form, e.g., as part of the hospital guideline. However, dissemination of printed materials in easy to access and readily available manner to all levels of health staffs but communication and understanding of these framework and guidelines among primary care level health staff as well as constant implementation of such guidelines still need significant improvement and capacity building. There are ongoing efforts to strengthen the existing guidelines for better formalization, to be more comprehensive and in line with good practices, and to have better compliance of health staff to the guidelines.

In addition, as per preparation the brief assessment of the (EHSA) project disclosed various limitations in the current health sector relevant to project activities as listed below:

- Incomplete information about current health legislation, technical guidelines and other policies linked to possible environmental impacts and their management generated by health care activities in Myanmar
- Inadequacies in the legal, regulatory, policy and administrative framework of healthcare waste management and treatment
- Relatively simple/minimal health care waste management practices in health care facilities with regard to handling inclusive of waste pre-treatment, collection, storage, transportation and final disposal
- Health care waste at the source of generation is not being segregated according to its type for easy treatment and final disposal
- Poor compliance with health care waste characterization related waste quantities and composition and limited information on waste generation
- Lack of segregation of waste according to categories
- Insufficient knowledge on and practice of health care waste minimization, reuse and recycling approach at township and sub-levels
- Lack of regional/centralized disposal facility to handle large quantities of healthcare waste
- Low level of awareness of and poor compliance with code of conduct, universal precaution and technical guidelines for safety measures
- Lack of written standards for waste operation procedures
- Insufficient resources for training of health care personnel and education and public awareness in link to healthcare waste management, required in future comprehensive Township Health Plan.

Further, availability of appropriate equipment and technologies to deal with health care waste treatment and final disposal in country is limited and almost inexistent. It is significantly promising that improved management of segregating waste within health care facilities can result in reduction of the proportional amount of waste requiring special treatment and disposal costs. In addition, technologies worldwide are available to treat and disinfect biomedical and health care wastes so that the waste can finally be disposed of with low risk to both human health and the environment.

Therefore, to meet fore mentioning needs, to avoid unwanted consequences and to overcome limitations surface out during brief assessment at preparatory phase good international practices should be made available in Myanmar context and followed to strengthen the country health care waste management capacity. The strengthening stream must incorporate infrastructure and staff skills and public awareness, in addition to development of appropriate policy, institutional strengthening and monitoring systems. This enlightenment facilitates as a crucial driving force in the development of Health Care Waste Management in Myanmar perspective and ensures to make in view.

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The development of the Health Care Waste Management Guidelines for health care providers, health workers and waste handlers is a key mile stone for the Occupational and Environmental Health Division, Department of Public Health, Ministry of Health. The process of developing this guideline was originated from the relentless efforts of actively involved various partners and concerned stakeholders in the field of health care waste management. Among them the institutes, departments that stood on top of the list to deliver vote of thanks because of not merely present in series of such guideline development workshops also mobilized the process with technical inputs include Department of Medical Services, Department of Medical Research, Division of Disease Control, Department of Environmental Conservation, Yangon City Development Committee particularly the Pollution Control and Cleansing Division, Mandalay City Development Committee, Nay Pyi Taw City Development Committee and so on.

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Occupational and Environmental Health Division
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Abbreviations

DoPH	Department of Public Health
HCWM	Health Care Waste Management
MEHSA	Myanmar Essential Health Services Access Project
MoH	Ministry of Health
PPE	Personal Protective Equipment
RHC	Rural Health Center
SC	Rural Health Sub-center
SH	Station Hospital
SOP	Standard Operating Procedure
TH	Township Hospital
UHC	Urban Health Center
WHO	World Health Organization

1. Introduction

Myanmar is facing considerable challenges in the area of waste management including health care waste. This is due to increasing consumption, growing urban population, increasing health care facilities and weak waste management system. Health care waste management is the concerned issues in this newly reformed era. Due to the emergence of high prevalent and highly contagious infectious diseases, effective health care waste management becomes more prominent. The health care waste management is not only important for the healthcare workers, doctors, nurses, waste collectors, waste transporters, but also for the patients and general community. Improper health care waste management affects the environment and eco system as well.

2. Definitions

2.1. Health Care

The term Health Care includes medical activities such as diagnosis, monitoring, treatment, prevention of disease or alleviation of handicap, including related research, performed under the supervision of a medical practitioner or another person authorized by virtue of their professional qualifications.

2.2. Health Care Waste

The term Health Care Waste includes all the waste generated within health care facilities, research centres and laboratories related to medical procedures. In addition, it includes the same types of waste originating from minor and scattered sources, including waste produced in the course of health care undertaken in the home e.g. home dialysis, self-administration of insulin, recuperative care.³

³ Safe Management of Waste from Healthcare activities, WHO, 2014, 2nd ed

2.3. Health Care Waste Management

The term Health Care Waste Management includes measures that ensure the safe and environmentally sound administration and supervision of waste generated from the health care facilities to prevent adverse health and environmental impacts.⁴

3. Objectives

The objectives of the development of this guideline are;

3.1. General objective

- To ensure safe management of waste generated from the health care facilities.

3.2. Specific objectives

- To develop and issue Standard Operating Procedures HCWM for deferent levels of health care facilities
- To develop procedural details of health care waste management
- To monitor the implementation of HCWM SOPs by health care facilities and to safeguard the environment from HCW pollution
- To apply by all level of health care services either public or private sectors.

4. Scope

4.1. The scope of the guideline is to be applied in Basic Government Health Facilities which include Township hospitals, Station hospitals, urban health centers, Rural health centers and Sub-rural Health centers. However, it may be applied in all health facilities in public and private sectors.

4.2. The guideline covers hazardous solid waste only. It may be extended to manage hazardous liquid waste.

⁴ Safe Management of Waste from Healthcare activities, WHO, 2014, 2nd ed

5. Policy Statement⁵

Health Care Waste Management Policy should include;

- Green Purchasing
- Waste minimization
 - Reduce generation
 - Reuse
 - Recycle
 - Separate non-hazardous and hazardous wastes
- Polluter pays policy
- Infection control policy
- Occupational health and safety of waste handlers
- All stakeholders are responsibility, not only health care institutions

6. Legal Frameworks

National and international legal tools which are relevant to management of hazardous and non-hazardous HCW are;

- National Health Policy
- National Environment Policy (Draft)
- Public Health Law
- Private Health Care Law
- Chemical Safety Law
- Environmental Conservation Law
- CDC Laws
- Environmental Conservation Rules
- Hospital Guidelines
- Hospital infection Control Guidelines
- International Conventions

⁵ No existing National Policy on HCWM

- o Stockholm
- o Basel
- o Minamata
- o [International nuclear treaties]

7. Categories of health care waste

7.1. Categories of health care waste

<u>Waste category</u>	<u>Examples</u>
<u>Hazardous health care waste</u>	
Sharp waste	Used or unused sharps (e.g. hypodermic, intravenous or other needles; auto-disable syringes; syringes with attached needles; infusion sets; scalpels; pipettes; knives; blades; broken glass)
Infectious waste	Waste suspected to contain pathogens and that poses a risk of disease transmission (e.g. waste contaminated with blood and other body fluids; laboratory cultures and microbiological stocks; waste including excreta and other materials that have been in contact with patients infected with highly infectious diseases in isolation wards)
Pathological waste	Human tissues, organs or fluids; body parts; foetuses; unused blood products
Pharmaceutical waste, cytotoxic waste	Pharmaceuticals that are expired or no longer needed; items contaminated by or containing pharmaceuticals Cytotoxic waste containing substances with genotoxic properties (e.g. waste containing

	cytostatic drugs – often used in cancer therapy; genotoxic chemicals)
Chemical waste	Waste containing chemical substances (e.g. laboratory reagents; film developer; disinfectants that are expired or no longer needed; solvents; waste with high content of heavy metals, e.g. batteries; broken thermometers and blood-pressure gauges)
Radioactive waste	Waste containing radioactive substances (e.g. unused liquids from radiotherapy or laboratory research; contaminated glassware, packages or absorbent paper; urine and excreta from patients treated or tested with unsealed radio-nuclides; sealed sources)
<u>Non-hazardous or general health care waste</u>	Waste that does not pose any particular biological, chemical, radioactive or physical hazard ⁶

7.2. Descriptions of health care wastes

7.2.1. Sharp waste

Sharps are items that could cause cuts or puncture wounds, including needles, hypodermic needles, scalpels and other blades, knives, infusion sets, saws, broken glass and pipettes. Whether or not they are infected, such items are usually considered highly hazardous health care waste and should be treated as if they were potentially infected.

⁶ Safe Management of Waste from Healthcare activities, WHO, 2014, 2nd ed

7.2.2. Infectious waste

Infectious waste is material suspected to contain pathogens like bacteria, viruses, parasites or fungi in sufficient concentration or quantity to cause disease in susceptible hosts. This category includes:

- waste contaminated with blood or other body fluids
- cultures and stocks of infectious agents from laboratory work
- waste from infected patients in isolation wards.

Waste contaminated with blood or other body fluids include free-flowing blood, blood components and other body fluids; dressings, bandages, swabs, gloves, masks, gowns, drapes and other material contaminated with blood or other body fluids; and waste that has been in contact with the blood of patients undergoing haemodialysis, e.g. dialysis equipment such as tubing and filters, disposable towels, gowns, aprons, gloves and laboratory coats.

Laboratory cultures and stocks are highly infectious waste. Waste from autopsies, animal bodies, and other waste items that have been inoculated, infected, or in contact with highly infectious agents or other international or national risk-based classification of pathogens) are highly infectious waste. Discarded instruments or materials that have been in contact with persons or animals infected with highly infectious agents are also to be considered infectious waste.

Waste from infected patients in isolation wards includes excreta, dressings from infected or surgical wounds, and clothes heavily soiled with human blood or other body fluids. Waste from non-infective patients and that is not contaminated with blood or body fluids may be considered non-infectious. In low-resource settings, the infection-control or medical personnel should determine whether waste from non-isolation ward patients should be classified as infectious waste. They should apply the principles of the

chain of infection to assess the risk of disease transmission from local practices used in the collection, handling, transport, treatment and disposal of waste.

7.2.3. Pathological waste

Pathological waste could be considered a subcategory of infectious waste, but is often classified separately – especially when special methods of handling, treatment and disposal are used. Pathological waste consists of tissues, organs, body parts, blood, body fluids and other waste from surgery and autopsies on patients with infectious diseases. It also includes human foetuses and infected animal carcasses. Recognizable human or animal body parts are sometimes called anatomical waste. Pathological waste may include healthy body parts that have been removed during a medical procedure or produced during medical research.

7.2.4. Pharmaceutical waste, including cytotoxic waste

Pharmaceutical waste includes expired, unused, spilt and contaminated pharmaceutical products, prescribed and proprietary drugs, vaccines and sera that are no longer required, and, due to their chemical or biological nature, need to be disposed of carefully. The category also includes discarded items heavily contaminated during the handling of pharmaceuticals, such as bottles, vials and boxes containing pharmaceutical residues, gloves, masks and connecting tubing.

Genotoxic means toxic to the deoxyribonucleic acid (DNA); cytotoxic means toxic to the cell; cytostatic means suppressing the growth and multiplication of the cell; antineoplastic means inhibiting the development of abnormal tissue growth; and chemotherapeutic means the use of chemicals for treatment, including cancer therapy.

Cytotoxic wastes are generated from several sources and can include the following:

- contaminated materials from drug preparation and administration, such as syringes, needles, gauzes, vials, packaging;
- outdated drugs, excess (leftover) solutions, drugs returned from the wards;
- urine, faeces and vomit from patients, which may contain potentially hazardous amounts of the administered cytostatic drugs or of their metabolites, and which should be considered genotoxic for at least 48 hours and sometimes up to 1 week after drug administration.

7.2.5. Chemical waste

Chemical waste consists of discarded solid, liquid and gaseous chemicals; for example, from diagnostic and experimental work and from cleaning and disinfecting procedures. Chemical waste from health care is considered to be hazardous if it has at least one of the following properties:

- toxic
- corrosive
- flammable
- reactive
- oxidizing.

Non-hazardous chemical waste consists of chemicals with none of the above properties; for example, sugars, amino acids and certain organic and inorganic salts, which are widely used in transfusion liquids.

7.2.6. Radioactive waste

Radioactive wastes are materials contaminated with radio-nuclides. They are produced as a result of procedures such as in vitro analysis of body tissue and fluid, in vivo organ imaging and tumour localization, and various investigative and therapeutic practices.

7.2.7. Non-hazardous general waste

Non-hazardous or general waste is waste that has not been in contact with infectious agents, hazardous chemicals or radioactive substances and does not pose a sharps hazard. A significant proportion (about 85%) of all waste from health care facilities is non-hazardous waste and is usually similar in characteristics to municipal solid waste. More than half of all non-hazardous waste from hospitals is paper, cardboard and plastics, while the rest comprises discarded food, metal, glass, textiles, plastics and wood.

8. Process of Health Care Waste Management (Technical Guidelines)

8.1. Supporting green purchasing

All health facilities should support green purchasing items with reusable, recyclable, or no packaging.

8.2. Waste minimization

Quantity of HCW should be minimized through following strategies.

8.2.1. Reduction of waste

1. Quantifying the waste produced.
2. Examining each work process steps to determine where wastes are produced and to devise measures for waste prevention or reduction.
3. Devising ways of reducing waste with employees.
4. Partnering with relevant stakeholders to assist waste minimization.

8.2.2. Reusing

1. Reusing drums, cartridges and containers where possible.
2. Selling or donating reusable waste to other organizations.

8.2.3. Recycling

1. Segregating wastes wherever possible to aid recycling and provide an indication of why waste is forming.
2. Diverting recyclable wastes from the general waste, identifying recyclers and organizing regular collections.

8.3. Segregation of HCW

1. All health care waste should be segregated as soon as it is generated.
2. Each type of waste should be contained in designated bags and containers.
3. Sharp waste should be segregated into sharp containers or red color bags.
4. Infectious waste, pathological waste, anatomical waste should be segregated into separate yellow color bags with appropriate labels and logos.
5. Separate pharmaceutical and chemical waste into brown color bags or containers.
6. Double yellow bags should be used for high risk infectious waste.
7. General waste should be segregated into black color waste.

8.4. Labeling

1. All bags and containers must be identified at the point of production and should be clearly marked with biohazard symbol.
2. Name or department of the waste generator should be included in the label.
3. The date when the scheduled wastes are first generated should be posted onto the container with appropriate label for storage of waste.
4. Labelling can be done in a number of ways at least writing the information on the bag or container.
5. Clinical waste requiring autoclaving or other equivalent treatment should be labelled accordingly.

8.5. Storage of HCW

1. Different health care waste should be streamed separately in standard storage equipment.
2. Storage time of health care waste should not exceed 48 hours.
3. Anatomical waste should be buried or disposed daily.
4. Storage room or place and equipment should be cleaned and disinfected at least once a week.
5. Specific areas should be for the initial storage of wastes, in the wards and departments, near the source of waste.
6. Location of central storage area should be away from food preparation, public access and exit route.
7. Central storage area should be separated from general waste storage areas.
8. Waste for landfill and waste for incineration should be stored separately in the central storage area.

8.6. Transportation of HCW

1. Waste bags and containers from initial storage area should be removed regularly.
2. Manual handling of waste bags should be minimized.
3. All waste bags should be handled by the neck.
4. Discard syringes with attached needles into sharp containers as one unit.
5. Internal transport routes from initial storage to central store through patient care areas and other clean areas should be minimized.
6. Dedicated wheeled containers, trolleys or carts should be used to transport the waste containers to central storage area. These vehicles should be reserved only for the transportation of clinical waste.
7. Wheeled containers, trolleys or carts should be cleaned and disinfected regularly and immediately after spillage or accidental discharge.

8.7. Central Storage Facility for HCW

The central storage area must be:

- Located separately from the general waste storage areas.
- Should be clearly identifiable.
- Away from food preparation, public access and egress route.
- Arranged to store waste for landfill and waste for incineration waste separately.
- Locked when access is not required and should be accessible only to authorized persons.
- Well ventilated and well lit.
- Located on well drained, impervious hard-standing.
- Provided facilities for washing down and disinfection.
- Should be sufficient for storage capacity.

8.8. Treatment of HCW

1. Infectious waste should be autoclave wherever possible before disposal.
2. Non-autoclave infectious waste should be disinfected chemically by using bleaching powder, lime solution, calcium oxide or other chemical disinfectants.
3. Needle cutter should be used to displace needles from syringes.
4. Disinfect defanged syringes by 2% chlorine solution in order to be recycled.

Autoclave

Autoclaves are commonly used for the treatment of highly infectious waste, such as microbial cultures or sharps. Small amount of waste (about 5-8 kg) requires a 60-minute cycle at 121°C (minimum) and 1 bar (100 kPa). Validation of autoclave should be conducted and microbial inactivation efficacy of autoclaves should be checked periodically by using colour-changing indicator strips.

Chemical Disinfection

0.5% Chlorine solution, 5% sodium hypochlorite, 30% hydrogen peroxide, bleaching powder, lime solution, calcium oxide or other chemical disinfectants can be used for non-autoclavable infectious waste.

8.9. Disposal of HCW

1. Non-treated infectious waste, placenta and small anatomical waste should be incinerated wherever possible.
2. Placenta and small anatomical waste should be disposed to placenta pit where there is no effective incinerator.
3. Pharmaceutical waste should be encapsulated or inertized.
4. General waste, sharp waste and treated waste should be disposed to municipal waste collecting system.
5. Sharp waste should be disposed to sharp pit where there is no municipal waste collecting system.
6. General waste and treated waste should be disposed to sanitary land filling where there is no municipal waste collecting system.
7. Large anatomical waste should be buried in appropriate site.

Standardized Incinerator

Two-chambered incinerators with proper temperature, required chimney heights should be used. The temperature must be at least of 850°C to ensure minimal emission of toxic gases at the primary chamber. High chimney (higher than nearby roofs) is required. Appropriate location (at least of 500 meters away from populated areas) is required. Ash disposal facilities is also required. Pressured gas containers, radioactive wastes, radiographic wastes, halogenated plastics like PVC, mercury, cadmium and ampoules of heavy metals should never be incinerated.

Sanitary Land Filling

Sanitary landfills are easy access to the site and working areas for waste delivery. Landfill site should be at least 50 meters away from the water sources. The landfill site must be protected with fence to prevent from unauthorized persons and animals. Lining of the base and sides of the sites must be adequately sealed to minimize the movement of waste water. Final cover must be constructed to prevent or minimize rain water infiltration.

Encapsulation and Inertization

It is usually suitable disposal method for the pharmaceuticals and incinerated ash with heavy metal content. When containers are three quarters filled with pharmaceutical and chemical waste, a mixture of cement, lime and water is poured into it. The material is allowed to be dried and the container is sealed and disposed safely. In an alternative procedure, the formed homogeneous mixture in liquid state can be transported to a landfill and poured safely.

Sharp pit and Placenta pit

The attached designs in annexes should be constructed.

Waste Water Disposal

Waste water from healthcare facilities should be disposed according to the reference of safe management of waste from healthcare activities developed by WHO.

Waste from laboratories

Laboratory waste should be disposed according to the reference of instructions developed by National Health Laboratory, Myanmar.

8.10. Emergency Response on Spillage and Accidental Discharge

In case of spillage and accidental discharge of hazardous HCW:

1. Contaminated areas should be cleared and if necessary disinfected.
2. The exposure of workers should be limited as much as possible during the operation.
3. The staff should be well prepared for emergency response and
4. The required equipment should be easily available at reasonable distances.

9. Implementation at Different Levels and Stakeholders

Standard Operating Procedures (SOPs) for HCWM should be developed and issued to ensure safe management of hazardous wastes which are generated by health care facilities.

9.1. These SOPs should be specific for different levels of health facilities.

- Township Hospital (TH)
- Station Hospital (SH)
- Urban Health Center (UHC)
- Rural Health Center (RHC)
- Rural Health Sub-center (RSC)
- Immunization Posts within the coverage of Rural Health Sub-center

9.2. Contents of SOPs should be;

- Purpose
- Scope of Application
- Responsibility
- Equipment and Supplies
- Method
- Issuance and authorized person

9.3. Different SOPs should be issued for each process of waste management.

- Waste segregation
- Storage
- Transport
- Treatment
- Disposal

10. Sustainability and Financial Mechanism

A complete infrastructure and a strong financial mechanism should be developed to ensure sustainability of effective and proper HCWM for each health care facility.

10.1. Infrastructure of HCWM

All health care facilities should have;

- Special building and structures for HCWM
- Necessary equipment
- Necessary consumables

10.2. Budget

For government health care facilities, department concerned should draw a budget line to ensure separate allotment for expense of proper HCWM.

11. Organization and Human Resource Management

11.1. Authorities

The sole authority of proper should be Department of Public Health (DoPH). It should delegate its authority to different levels of HCWM Committees to supervise and monitor the safe management of hazardous waste by health care facilities.

11.2. Health Care Waste Management Committee

11.2.1. HCWM Committee should be set up by;

- Medical Superintendent
- Consultants of various disciplines
- Pathologist
- Microbiologist
- Pharmacist
- Radiologist
- Nurse in charge
- Engineer
- Infection control in charge
- Waste management in charge

11.2.2. For small health care facilities, HCWM Committee will be formed with appropriate persons available.

11.3. Job allocations and responsibilities

The prime responsible person for HCWM is In Charge of the health facility. Job allocations and responsibility of members of the HCWM Committee will be described by the In Charge of the health care facility.

11.4. Training and Capacity Building

All health care providers and workers of health care facilities should attend the prescribed HCWM training courses.

HCWM Training Module 1 is knowledge based and for management people. HCWM Training Module 2 is skill based and for operation people and waste handlers.

11.5. Occupational health and safety of waste handlers

All hazardous waste handlers should be provided;

- Personal Protective Equipment (PPE) – caps, masks, heavy duty gloves, goggles, aprons and shoes
- Medical examinations – pre employment medical examinations and periodic medical examinations
- Immunization/ Vaccination – at least ATT and HBV vaccine
- Special allowance wherever possible.

12. Documentation and Record Keeping

12.1. Documentation

Documentation needs the waste inventory notes and waste consignment notes.

12.1.1. Waste Inventory Note

A waste inventory note is used to record the detail information of waste generated by a health care facility.

A waste inventory note contains;

- Categories and quantities of waste generated, treated and disposed on-site, and
- Categories and quantities of waste transported off-site.

12.2.2. Waste Consignment Note

A waste consignment note is used for the transportation of waste from the health care facilities to the final disposal site especially to the municipal facilities.

A waste consignment note contains;

- Name of health care facility,
- In charge of waste transport,
- In charge of final disposal facility, and

- Detailed information of waste transported and disposed.

12.3. Record keeping

All waste inventory notes and waste consignment notes should be retained as record by the health care facilities for minimal period of three years.

13. Monitoring and Evaluation

13.1. Supervision

Supervision of HCWM for a health care facility should be performed by HCWM Committee of that facility and HCWM Committee of appropriate/ responsible larger health care facility.

13.2. Monitoring

Monitoring of HCWM for a health care facility should be performed by HCWM Committee of that facility and HCWM Committee of appropriate/ responsible larger health care facility.

Monitoring of HCWM should be performed six monthly/ twice a year.

Monitoring reports should be submitted to responsible authority.

13.3. Evaluation, review and revision

HCWM guideline and SOPs should be reviewed by using the information provided by evaluation and should be revised in maximal period of (three) years.

Annexes

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Annex A: Sample health care waste inventory note

Inventory of Health Care Waste⁷

Date	Waste Category	Name of Waste Generator	Quantity	Waste Handling		
				Method	Quantity	Site

⁷ Ref: HCWM, Malaysia

Annex B: Sample health care waste consignment note

Consignment Note for Health Care Waste⁸

A. For Waste Generator

Name of Waste Generator:	Address:
Name of Responsible Person:	
Name of Waste:	
Packaging:	
Quantity:	
Name and Address of Final Destination:	
Delivery Date:	Signature:

B. For Transporter

Name of Waste Transporter:	Address:
Name of Responsible Person:	
Vehicle Registration Number:	
Name of Driver:	Signature:

C. For Disposal Site

Name of Facility:	Address:
Name of Responsible Person:	
Type of Operation:	
Quantity Received:	
Date Received:	Signature:

⁸ Ref: HCWM, Malaysia

Annex C: Checklist for Application of HCWM SOPs in a Health Care Facility

Name of the Health Facility:

Address:

Name of the Head of Health Facility:

Name and Designation of Waste Management In-charge:

Date of Inspection:

Score: All Yes = 1 point, Any No = 0 point

Sr.		Yes	No	Score
1	Establishment of SOP			
	Have the SOPs been issued?			
	Are SOPs placed on Notice board?			
	Have all staff and workers read and signed the SOPs?			
	Has the in-charge of HCWM been assigned?			
2	Segregation of HCW			
	Do the staff and workers segregate the waste?			
	Do the staff and workers use colour coding?			
	Are waste containers placed properly?			
	Do the staff and workers use the color-coded waste bags?			
	Is there a needle cutter in injection room? (ignore if not supplied)			
	Do the staff practice needle cut? (ignore if not supplied)			
	Is there sharp container in the injection room?			
3	Storage of HCW			
	Are different wastes stored differently?			
	Does storage time of health care waste not exceed 48 hours?			
	Is anatomical waste buried or disposed daily?			
	Is storage room and equipment cleaned and disinfected at least once a week?			

	Are there specific areas for the initial storage of wastes in the wards and departments or near the source of waste?			
	Is location of central storage area away from food preparation, public access and exit route?			
	Is central storage area located separately from general waste storage areas?			
	Is there a practice of separating landfill waste and incinerable waste in the central storage area?			
4	Transport			
	Are waste bags and containers from initial storage removed regularly?			
	Is there an instruction to minimize manual handling of waste bags?			
	Is there a practice of handling all waste bags by the neck?			
	Is there a plan for internal transport routes from initial storage to central store?			
	Are there dedicated wheeled containers, trolleys or carts to transport the waste containers?			
	Is there a practice to clean and disinfect wheeled containers, trolleys or carts regularly?			
	Is there an instruction to clean and disinfect wheeled containers, trolleys or carts immediately after spillage or accidental discharge?			
5	Treatment			
	Is autoclavable infectious waste autoclaved before disposal?			
	Is non-autoclavable infectious waste disinfected by using chemicals before disposal?			
	Does staff use needle cutters? (if supplied)			
6	Disposal			
	Is an incinerator in use? (ignore if there is no incinerator)			
	Is non-treated infectious waste incinerated? (ignore if there is no incinerator)			

	Is small anatomical waste incinerated? (ignore if there is no incinerator)			
	Is placenta incinerated? (ignore if there is no incinerator)			
	Is a sharp pit in use? (ignore if there is an incinerator)			
	Is a placenta pit in use? (ignore if there is an incinerator)			
	Does a sanitary land fill practice? (ignore if there is an incinerator)			
7	General			
	Is there a record keeping system?			
	Have any training regarding health care waste management given?			
	Are equipment and supplies adequate?			

Total Score: () out of 7.

Other Finding(s)

Is there a public participation on waste management?

Is there any experience of inspection on application of SOPs?

Impressing

Is overall compliance of waste management satisfactory?

Instruction / Recommendation:

	Name	Designation	Signature	Date
Checked by				
Countersigned by				
Approved by				

References

1. Department of Environment, Guideline on the Handling and Management of Clinical Wastes in Malaysia, Malaysia, 2009, 3rd Edition.
2. Government of Tamil Nadu, Handbook on biomedical waste management, India, 2008.
3. Ministry of Health, Write out instructions for medical devices, Myanmar. 1991.
4. Ministry of Health, MOH policy and guidelines for health institutions, Health care waste management in Ghana, Ghana, 2006.
5. Ministry of Health, Infection Prevention and Control Guidelines for health care facilities, Cambodia, 2010.
6. Ministry of Health, Hospital Management Manual, Myanmar, Nay Pyi Taw, 2011.
7. Ministry of Health, Department of Hospital Services and Working Group on Health care waste management, National Guideline on Health care waste management, Cambodia, Phnom Penh, 2012.
8. Ministry of Health, Myanmar Essential Health Services Access Project, Environmental Management Plan, Yangon, Myanmar, 2014.
9. Ministry of Health and Population, Department of Health Services, Health care waste management guideline, Nepal, 2014.
10. Ministry of Health, Department of Medical Services, Hospital Infection Control Guidelines, Myanmar, Nay Pyi Taw, 2016.
11. Ministry of Health, National Health Laboratory, Medical Laboratory Waste Management Instruction, Myanmar, 2016.
12. Ministry of Health, Department of Food and Drug Administration, Laboratory waste disposal at Pharmaceutical Chemistry Laboratory, Myanmar, 2016.
13. Ministry of Health, National Guideline on Health care waste management, Rwanda, 2016.
14. National Health and Medical Research Council, National Guidelines for waste management in the health care industry, Australia, 1999.
15. World Health Organization, Laboratory Biosafety Manual, Geneva, 2004.

16. World Health Organization, Safe management of waste from healthcare activities, Geneva, 2014, 2nd Edition.