Ministry of Health

HEALTH CARE WASTE MANAGEMENT GUIDELINES

FOREWORD

Health care services inevitably generate waste that may be hazardous to health or have harmful environmental effects. Some of them, such as sharps or infected blood, carry a higher potential for infection and injury than any other type of waste. Their improper management can cause direct health impacts on the personnel working in the health care facilities or on the communities. Sound management of health care waste (HCW) is thus a crucial component of environmental health protection.

In both the short and the long term, the actions involved in implementing an effective health-care waste management program require multi-sectoral co-operation and interaction at all levels. Policies should be generated and co-coordinated nationally. Establishment of a national policy and legal framework, training of personnel and raising public awareness are essential elements of successful health-care waste management. Improved public awareness of the problem is essential in encouraging community participation in generating and implementing policies.

To achieve this aim, the Ministry of Health and Population in collaboration with its partners: UNICEF, WHO, World Bank set up a consultancy team to assess health-care waste management and developed a Policy and Strategic Plan for HCWM for Malawi in 2003. This document, the result of their efforts, was intended to be a comprehensive yet concise, "User-friendly" policy oriented towards practical management of health-care waste in local facilities. It provided guidelines for legal framework, training of personnel, raising public awareness and provision of human and financial resources necessary for the definition and implementation in a sustainable and effective health-care waste management program in Malawi.

Ten years down the line, the Interagency Coordinating Committee (ICC) has decided to separate the guidelines from the policy so that the two documents can stand alone and complement each other.

It is my hope that this policy will stimulate collaborated effort to implement the strategies so that effective health-care waste management system can be achieved in Malawi

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Minister of Health and Population

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Finally we thank the Interagency Coordinating Committee

Dr. Samsom Mndolo

The Secretary for Health and Population

EXECUTIVE SUMMARY

The National HCWM Coordinating Committee recommended that the guidelines and Strategic Plan be reviewed, after observing that the HCWM guidelines were not aligned to the national policy format and that it was developed including an implementation plan.

The guidelines have remained in the draft form since they were developed between November 2002 and January 2003 when an assessment of health care waste management was carried out in 29 health facilities (public, CHAM and private). The assessment identified some key problems that existed in the health care system in Malawi and these included; (i) deficient institutional and legal framework; (ii) mediocre behaviour and practices of health care workers and waste handlers; (iii) insufficient financial resource allocation to HCWM; (iv) in-existence of private agencies that deal with health care waste collection and treatment; (v) lack of clarity given to HCWM in the National Health Policy and; (vi) non- performing organizational structure and equipment within the healthcare system. A follow-up assessment was conducted in 2007 in 115 institutions including health facilities (public, CHAM and private) and some key supporting systems such as Training institutions, Local councils, ministries and departments. The follow up assessment identified similar key problems except that the assessment for status of private agencies that deal with HCWM collection and treatment was not done and therefore the results were not available. In order to address these problems, MOHP needs these guidelines.

The guidelines are structured around the following: (I) Introduction that covers the background, rationale, linkages with relevant policies and key challenges and barriers (2) Broad strategic

directions which cover guidelines vision, mission, goal, objectives and strategies (3) Guidelines Themes (4) Implementation arrangements and (5) Monitoring and Evaluation.

The guidelines finally outline the Glossary, including definition of impact monitoring indicators, Implementation Plan and Guidelines impact monitoring and Evaluation framework.

ABBREVIATION AND ACRONYMS

AD	Auto-Disable (type of syringe)
AIDS	Acquired ImmunoDeficiency Syndrome
BCG	Bacilli Chalmette Guerin
BCI	Behaviour Change Intervention
CBO	Community Based Organization
CHAM	Christian Health Association of Malawi
CMED	Central Monitoring and Evaluation Division
EAD	Environmental Affairs Department
DEHO	District Environmental Health Officer
DFID	Department for International Development
DHMT	District Health Management Team
EHP	Essential Health Package
EPI	Expanded Programme on Immunisation
GAVI	Global Alliance for Vaccines and Immunisation
HBV	Hepatitis B Virus
HCF	Healthcare Faciltiy
HCV	Hepatitis C Virus
HCW	Healthcare Waste

HCWM	Health Care Waste Management
HiB	Haemophilus Influenzae type B
HIV	Human Immunodeficiency Virus
IEC	Information Education and Communication
ICC	Inter-agency Co-ordinating Committee
IMCI	Integrated Management of Childhood Illness
IHAM	Islamic Health Association of Malawi
IS	Injection Safety
HCWMU	Health Care Waste management Unit
KuHes	Kamuzu University of Health Sciences
MBS	Malawi Bureau of Standards
MCH	Maternal and child Health
MCHS	Malawi College of Health Sciences
MCM	Medical Council of Malawi
MDA	Mass Drug Administration
MLG	Ministry of Local Government
MECC	Ministry of Environmental Affairs and Climate Change
MOH	Ministry of Health
NEHP	National Environmental Health Plan
NGO	Non-Governmental Organisation
NMCM	Nurses and Midwives Council of Malawi
PPE	Personal Protective Equipment
PPP	Public Private Partnership
RHU	Reproductive Health Unit
STD	Sexually Transmitted Diseases
STI	Sexually Transmitted Infections
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USD	United States Dollar
USAID	United States Agency for International Development
WB	World Bank

WHO	World Health Organisation

Definition of Terms

Healthcare waste: Healthcare waste includes all the waste generated by health-care establishments, research facilities, and laboratories. In addition, it includes the waste originating from "minor" or "scattered" sources—such as that produced in the course of health care undertaken in the home (dialysis, insulin injections, etc.).

Non Infectious waste: Waste that does not pose any particular biological, chemical, radioactive or physical hazard e.g. papers, packaging materials, plastic bottles etc.

Infectious waste: Waste contaminated with blood and other bodily fluids (e.g. from discarded diagnostic samples), cultures and stocks of infectious agents from laboratory work (e.g. waste from autopsies and infected animals from laboratories), or waste from patients with infections (e.g. swabs, bandages and disposable medical devices);

Highly infectious waste: These includes anatomical and pathological waste for example;human tissues, organs or fluids, body parts and contaminated animal carcasses;
Sharps waste: Is a form of biomedical waste composed of used sharps which includes any device or object used to puncture or lacerate the skin. For example, syringes, needles, disposable scalpels and blades, etc.

Chemical waste: Is any solid, liquid or gaseous waste material that, if improperly managed or disposed of, may pause substantial hazard to human health and the environment. For example, solvents and reagents used for laboratory preparations, disinfectants, sterilant and heavy metals contained in medical devices (e.g. mercury in broken thermometers) and batteries.

Pharmaceutical waste: Expired, unusable / contaminated medicine and medical supplies as well as vaccines

Cytotoxic waste: Waste containing substances with genotoxic properties (i.e. highly hazardous substances that are, mutagenic, teratogenic or carcinogenic), such as cytotoxic drugs used in cancer treatment and their metabolites.

Radioactive waste: Is a type of hazardous waste that contains radioactive material such as products contaminated by radionuclides including radioactive diagnostic material or radio therapeutic materials.

Healthcare Waste Management: The processes and actions required to manage waste from its generation to its final disposal.

Healthcare **Waste Handler:** means a generator, transporter or receiver of trackable waste.

1.0 Introduction

1.1 Background

Healthcare waste has been defined by the World Health Organization (WHO) as "all the waste generated within healthcare facilities, research centres, and laboratories related to medical procedures; including the same types of waste generated from other scattered sources and homes(WHO, 2014)". Healthcare Waste Management (HCWM) is defined as "all activities, administrative and operational, involved in the handling, treatment, storage, recovery and recycling (of healthcare general waste) and the disposal of waste, including transportation.

Medical waste is classified into two main classes, The General or non-hazardous (non-infectious) waste and hazardous (infectious) waste. Hazardous waste can be further classified into sharps, infectious, pharmaceutical, cytotoxic, pathological, radioactive and chemical waste. The general wastes, which is comparable to domestic waste usually constitutes the bulk of medical waste of about 70- 90% and includes wastes generated from administrative works, packaging and maintenance works, while the hazardous wastes constitute only between 10-30% (1).

Healthcare institutions in the country continue to produce high amounts of both medical and non-medical wastes as result of increasing demand for healthcare services from the growing population. Significant amounts of the produced healthcare waste constitute infectious wastes that require safe disposal; however, the current HCWM practices and disposal system do not comply with safe waste disposal standards.

Improper healthcare waste management can cause direct health impacts on the personnel working in the health facilities or surrounding communities. Sound management of health care waste is thus a crucial component of environmental health protection. These guidelines will provide a framework for generation, segregation, storage, transportation, treatment and disposal of health care waste. The guideline will be linked to several policies, regulations, guidelines and Standard Operating Procedures (SOPs) to support its successful implementation.

1.2 Rationale

The enormous health risks to humans and the environment posed by medical waste range from direct injury to humans from disposing of used sharps to indirect injuries from land, water and air polluted with toxic chemicals from the medical waste (WHO, 2014). Several studies have reported an increase in the number of health care waste related diseases due to poor management of medical waste, various serious medical threats in the past have been linked to improper management of medical waste (WHO, 2014). Globally, about 5.2million people of which 4 million children die annually from healthcare waste related diseases and the situation will worsen if proper interventions are not implemented (WHO, 2014).

Emerging infectious diseases such as COVID-19 have substantially increased the generation of waste even at non-health care institutions and community level through increased use of disposable gloves, face masks, aprons and the introduction of testing services forCOVID-19, vaccination services as well as introduction of isolation units. These hazardous wastes pose a serious public health challenge as they have high potential of causing infections and injuries to patients, guardians, healthcare workers, persons handling them, the general public as well as being a hazard to the environment.

The Malawi Environmental Health report of June 2021 indicates that at least 80% of healthcare facilities either have incinerators that do not meet the minimum recommended international standards (ISO 14001) or literally do not have one. This compromises safe disposal of various healthcare waste, including destruction of expired drugs and related supplies,

In 2019 MoH conducted an assessment on healthcare waste management which revealed that the majority of health care institutions in the country do not practice safe waste handling, storage and disposal methods. The report indicated that 37.5% of the respondents showed that wastes are indiscriminately burned in open pits, 42.3% indicated no system is available for waste treatment whereas only 4% of the facilities indicated to use incinerators to burn the waste though not to the optimum temperatures. This compromises the quality of health care service due to the potential risk of infections arising from incinerators where poor healthcare waste management is practised. In addition, there is significant evidence of limited awareness on good healthcare waste

management practices among healthcare workers and the public at large contributing to poor handling and management of Health care waste.

Significant progress has been made to improve management of health care waste at all levels; however, there are no corresponding up-to-date health care waste management instruments such as legislations, policies and guidelines to guide its successful implementation. This has resulted in duplication of efforts by stakeholders, poor coordination of activities and monitoring of interventions.

1.3 Aims and objectives

1.3.1 Aim

The main aim of the guidelines is to provide a framework for implementation of appropriate waste management practices to avoid the spreading of infections, injuries and environmental pollution.

1.3.2 Objectives

- To promote the principles of integrated HCWM measures through multi-sectoral participation and creation of public awareness
- To improve coordination within the MOH with other relevant government agencies and other stakeholders.
- To advocate for allocation of adequate financial, material, infrastructure and human resources for HCWM.
- To strengthen the capacity of health care workers in HCWM.
- To promote public private partnership in HCWM.

1.4 Target users of the guidelines

These guidelines shall be used by health workers and all stakeholders involved in HCWM.

1.5 Classifications of Healthcare Waste

Healthcare waste is mainly classified into three categories which are Non-infectious wastes, infectious wastes and highly infectious wastes.

1.5.1. Non-infectious waste: This is similar to domestic waste. It is not harmful. Examples are waste from the hospital kitchen/canteen, sweepings from offices i.e. paper, cardboard, plastics, etc. and this accounts for 75 to 90 % of all healthcare wastes.

1.5.2. Infectious Waste: Waste generated by inpatient and outpatient activities that are likely to contain harmful organisms e.g. used gloves, gauze soiled with blood or fluids lines.

1.5.3 Highly infectious wastes are wastes consisting of anatomical and pathological waste. These includes; teeth, placenta, sputum and test tubes containing specimens.

2.0 Hazards arising from exposure to Healthcare Waste

Exposure to hazardous healthcare waste can result in diseases or injuries. The hazardous nature of health-care waste includes but not limited to the following characteristics:

- infectious;
- genotoxic;
- flammable;
- toxic;
- radioactive;
- corrosive;
- reactive;
- explosive;
- shock sensitive;
- sharps.

2.1 Hazards from infectious waste and sharps

Infectious waste may contain a variety of pathogenic microorganisms. Pathogens in infectious waste may enter the human body through: a puncture/abrasion/cut in the skin; mucous membranes; inhalation; and ingestion.

For example, health workers working in the laboratory are at risk of infection from human immunodeficiency virus (HIV) and hepatitis viruses B and C, for which there is strong evidence

of transmission via healthcare waste. These viruses are generally transmitted through injuries from syringe needles contaminated by human blood.

2.2 Hazards from toxic and pharmaceutical waste

These toxic wastes may come from various sources including chemicals and pharmaceuticals used in health-care establishments that are hazardous genotoxic, corrosive, flammable, reactive, explosive and shock-sensitive.

2.3 Hazards from reactive, corrosive and flammable waste

Reactive wastes are substances that readily explode or undergo violent reactions. For example, lithium-sulphur batteries and explosives. Corrosive wastes are materials that cause full thickness destruction of skin within four hours of exposure and materials that corrode through steel or aluminium at least 6.25mm. For example, automobile batteries. While fFlammable wastes are liquids with a flash point under 100 degrees, for examples Alcohol and Gasoline.

2.4 Hazards from radioactive waste

Radioactive wastes could be generated from various sources such as radiology departments. Handling of highly active sources, e.g. certain sealed sources from diagnostic instruments, may cause much more severe injuries and should therefore be undertaken with the utmost care. The hazards of low-radioactive waste may arise from contamination of external surfaces of containers or improper mode or duration of waste storage. Healthcare waste handlers are at risk of exposure to these radioactive wastes.

3.0 Themes of the Guidelines

The guidelines have the following themes where the healthcare services are provided:

- Healthcare waste Minimization
- Waste Segregation and Collection
- Waste Storage
- Waste Transportation

- Waste Treatment
- Waste Disposal
- Health Care Waste Related Accidents and Spillages
- Resources mobilization to support HCWM
- Research on HCWM
- Monitoring and Evaluation of HCWM

3.1 Health Care Waste Minimization:

Healthcare waste minimization is the process of reducing the amount or quantity of waste generated at the site of health service delivery by avoiding production of unnecessary wastes.
Waste minimization can be achieved by;

- Adhering to stock management principles such as:
    - Ordering of commodities according to needs
    - Observe first expiry-first out (FEFO) principles

- Recycling and using reusable medical devices, where feasible.
- Use of products or procedures which produce minimal waste, i.e use of oral drugs instead of injectable where possible.
- Familiarise and follow the Pharmacy and Medicines Regulatory Authority (PMRA) donation guidelines.
- Conducting risk assessment to determine the need.
- Thorough assessment of donations to avoid being a dumping site.

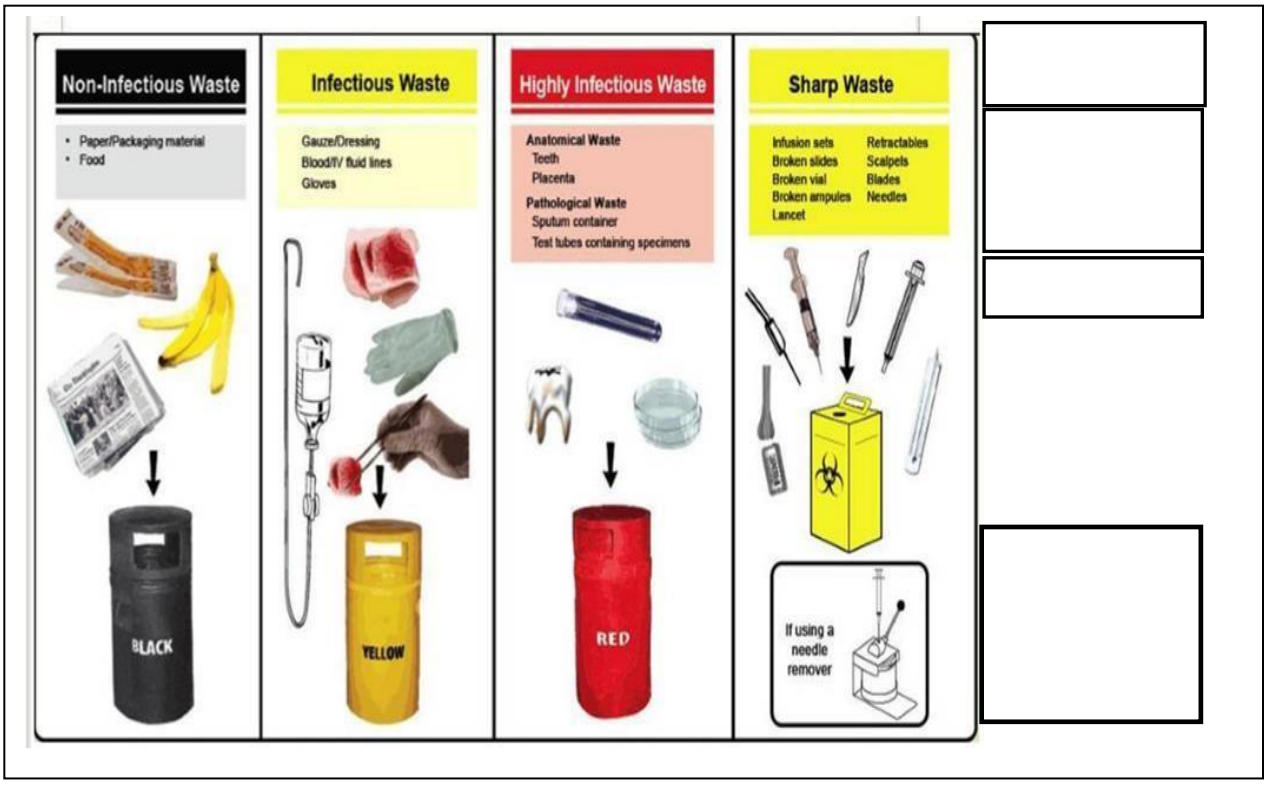
3.2 Healthcare Waste Segregation

Different types of waste require different treatment methods, hence proper segregation of waste into various categories is paramount. Segregation should be at the source of generation i.e. each type of waste must be placed immediately in its appropriate colour-coded and labelled container.

It is therefore a responsibility of every health care worker who generate waste regardless of cadre to participate in waste segregation.

There are three main colour codes of the containers and bin liners for health care waste commonly used, namely,

- Black for non-infectious waste,
- Yellow for infectious waste and sharps,
- Red for highly infectious waste



General Requirements for waste containers and Binliners

Containers for collecting waste should meet the following requirements:

- They should be non-transparent.
- They should be leak proof.

- Containers should be peddle operated
- Bin liners should be leak-proof
- At each service delivery point there should be a minimum of 3 containers including a sharps container.
- They should have close fitted lids.
- They should have sufficient strength to prevent easy damage during handling or use.
- Use bin liners that are compatible and of the same colour codes as the container
- Chemical waste bins should have a bio-hazard symbol
- Sharps containers should be puncture resistant and single use.

3.3 HealthCare Waste Collection and transportation

Healthcare waste must be collected and transported directly to disposal or treatment site within the shortest possible time (Not more than 48 hours) and route. Vehicles (e.g. transportation carts, hauling bins) used for transportation (internally or externally) should be designed to prevent scattering, odour and leakage.

Healthcare waste collection and transportation should follow the following principles;

- Collect waste bins /containers daily or when three quarter (3/4) full from the health service delivery sites to the temporary storage site/place (whichever comes first) to avoid spillage
- The bin liners should be properly secured (swan neck tie)
- Transport waste in a leak proof covered container
- Proper personal protective equipment (PPE) has to be used
- Transport waste during less traffic periods
- Use a designated route when transporting waste from internal storage to the treatment and disposal sites.

3.4 Healthcare Waste Storage

Storage begins from the moment of waste generation and last until collection for final disposal. There are two types of waste storage and these are internal and external.

Internal waste storage

This is temporary placement of waste at the designated secured internal storage sites/place before being transported to external storage sites.

The following shall apply to internal waste storage:

- Healthcare waste should not be stored at the internal storage site for more than 24 hours, preferably at the end of each shift.
- Provide every unit or ward in the health care facility with adequate numbers of appropriate waste containers.
- Weigh and record waste in a log book
- Once you drop waste in the container, do not pick items with hands from the container.
- Waste bins should be covered and protected from rain, pets and vermin, etc.
- Clean and disinfect waste containers after emptying.

External waste storage

This refers to the site where waste is stored after removal from internal storage awaiting final treatment.

The storage site should meet the following:

- Positioning of the waste management sites should follow wind direction to mitigate air pollution to the area/sites
- External storage areas for health care waste should be sited away from the reach of the general public and animals.
- The storage site should meet the following should be fenced and locked
- The floor should be smooth, impervious and easy to clean.
- Waste containers should be cleaned and disinfected after each collection and more frequently if required.
- The waste storage area should have a clear signage to keep public away

- Running water should be available for cleaning the area and washing the bins/containers

3.5 Healthcare Waste Treatment

Proper treatment of healthcare waste is necessary to ensure the negative impact on health workers, waste collectors, public and the environment is minimized or eliminated. It also helps to reduce the volumes of waste before disposal. The methods for health care waste treatment may include: disinfection, autoclaving and incineration.

3.5.1

Disinfection method uses chemicals (disinfectants) to make waste safe for handling and disposal.

3.5.2 Autoclaving Method

This uses autoclave to sterilise waste, especially laboratory waste.

3.5.3 Incineration

Incineration is the controlled burning of solid, liquid, or gaseous combustible wastes to produce gases and residues that contain little or no combustible material. Incineration uses high temperature which destroys microorganisms. It also reduces the volume of waste to be disposed of and is the best method for treatment of infectious wastes.

The common types of incinerators in Malawi are brick force, mechanical incinerator and pharmaceutical grade incinerator.

Simple brick force incinerator (batch burners) can be built from locally available materials like bricks and concrete blocks. Such an incinerator is useful only for primary level health care facilities. In secondary and tertiary health facilities, a mechanical incinerator is recommended (MS359:2004).

Facts to consider on incineration of HCW

• Incinerate health care waste only.

• Treat ash as non-infectious waste but with caution

• Placentas can also be incinerated

• Use fuel such as kerosene or diesel for effective incineration

• Bury or otherwise dispose of the ash in ash pit.

The following waste should not be incinerated:

- Pressurized gas containers (aerosol cans). They can explode, where possible recycle or put in a landfill.
- Large amounts of reactive chemical waste. Disinfect or neutralize based on the type of the chemical.
- Silver salts and photographic or radiographic wastes
- Plastic containing polyvinyl chloride (blood bags, IV sets, or disposable syringes). Refer to Environment Management (waste management and sanitation) Regulations.
- Waste containing high mercury or cadmium content, for example, broken thermometers, used batteries, and lead-lined wooden panels. Refer to Environment Management (waste management and sanitation) Regulations. MS691:2005

Disinfection/Chemical method

Disinfection method uses chemicals (disinfectants) to make waste safe for handling and disposal.

Autoclaving Method

This uses autoclave to sterilise waste, especially laboratory waste.

3.6 Healthcare Waste Disposal

The final step in the healthcare waste management is the disposal. The disposal method of choice depends on the type of waste.

The best disposal methods for health care waste are controlled tipping at proper sanitary landfill and burial.

- Ash from the incinerator should be disposed in the ash pit.
- Placentas should be disposed in the placenta pit
- The waste disposal points has to be a minimum of 30 metres from the service delivery points
- Glass should be crushed using a glass crusher.
- Liquid waste should be disposed of in the sewer system.

CHAPTER 4.0: STAKEHOLDER INVOLVEMENT

4.1 Roles and responsibilities of different stakeholders in HCWM

4.1.1 Head of Healthcare facility

Head of Hospital/health centres do supervise the everyday operations of healthcare facilities. They focus on improving the quality of patient care by ensuring the facilities are well-staffed and general management of the facility. Some of the specific roles include:

- Establish a waste-management team to oversee the preparation of specific HCF Waste Management Plan and monitor its implementation,
- Ensuring adequate resources allocated to fully implement specific Waste Management Plans
- Designate a waste management focal to supervise and implement the waste management plan in the HCF
- Obtain and be familiar with HCWM documents at national level.
- Ensure adequate training for staff in healthcare waste management and emergency response procedures.
- Put measures in place to prevent healthcare waste from causing environmental pollution or adverse effects on human health.
- Ensure health care waste management standards are being adhered to. (ensuring that health-care waste is adequately segregated and safely packed, especially in the case of sharps which should be packed in puncture-proof containers; and ensure that bags or containers

of health-care waste are handled only by those officially licensed to transport and/or dispose of such waste.)

- Ensure availability of health-care waste management infrastructure and equipment

4.1.2 Departmental Managers

The departmental managers should:

- Develop a facility HCWM plan (goal, budget, personnel, roles, supervision, training, reporting). Allocate adequate financial and human resources to implement the plan including up to final disposal.
- Ensure waste is minimised during generation
- Ensure adequate supply of safety boxes, bins, bin liners and PPE.
- Create a climate of support for needle stick injury reporting.
- Develop a protocol for management of needle-stick injury.
- Recommends for disposal of obsolete medical equipment and keep records of the equipment disposed
- Advocate for health worker safety.
- Provide supportive supervision in HCWM.

4.1.3 Healthcare Waste Management focal person

There should be a designated waste management focal person at the facility to map out and document all waste management gaps, recommend actions as well implementations of the actions. The healthcare waste management focal will be responsible for monitoring of the healthcare waste management system in the facility.

Roles of the Health-care Waste Management focal should include the following:

- Ensure the day-to-day operation and monitoring of the waste-management system.
- Disseminate information on healthcare waste management.
- Supervise waste handlers.
- Liaise with the department heads to make sure that their staff are carrying out health-care waste-related tasks properly.

- Ensure availability of health-care waste management infrastructure and equipment.
- Monitor performance indicators and ensure reports are submitted.
- Manage healthcare waste management budget.
- Organize staff training and information.
- Document, report and review any reported incidents concerning the handling of health-care waste in liaison with the infection prevention control focal.
- Liaise with the Supplies/store Department to ensure that an appropriate range of colour coded bags and containers for health-care waste, protective clothing, and collection trolleys are available at all times.
- Be responsible for coordinating maintenance and repair of waste treatment facilities; and
- Develop maintenance standards for waste management equipment. It is normal that most equipment requires preventive maintenance especially the incinerator.

4.1.4 Procurement Officer/ Internal procurement Committee

- Liaise with the healthcare waste management focal person to ensure a continuous supply of the healthcare waste management commodities (bin liners and containers of the right quality, spare parts for onsite healthcare waste treatment equipment).
- Purchasing environmentally friendly products e.g.Polyvinyl chloride – free products, Mercury free equipment, Recycled materials, Light Emitting Diodes etc.

4.1.5 Physical Asset Management (PAM)

- Installing and maintaining waste-storage facilities and handling equipment.
- Accountable for adequate operation and maintenance of any on-site waste treatment equipment
- Responsible for ensuring that the staff operating on-site waste-treatment facilities are trained in their operation and maintenance.
- Recommends for disposal of obsolete medical equipment and keep records of the equipment disposed

4.1.6 Healthcare Waste Handler

The healthcare waste handler is responsible for collecting, segregating, labelling, temporal storage, transporting infectious waste and other medical waste in accordance with relevant healthcare facilities. Specific roles include:

- Ensure waste is minimised during generation.
- Collects and transports medical waste and recyclable goods from generation points to specified collection location and incinerator.
- Tracking and maintaining records of wastes generated from each department.
- Cleans medical waste containers according to procedures.
- Segregates waste at point of generation, collection and transporting off-site for incineration.
- Separates, contains, seals, labels, weighs, and stores health-care waste to be incinerated
- Cleans and disinfects medical waste carts/bins/ waste containers.
- Maintains waste area facility in a clean and orderly condition; cleans area at the end of each shift.
- Assures safe working conditions at all times as designated by the SOP; utilizes safety equipment and/or protective equipment as directed (i.e. safety gloves and eye protection), follows defined safety procedures, and
- Follow waste management procedure during waste handling transportation, storage, treatment, and disposal including infection control.
- They need to report functionality of waste management equipment

4.1.7 Incinerator Operator

An incinerator operator is a skilled attendant assigned the duties of ensuring that the waste has been properly treated through incineration and the ash properly disposed. The operator should always be provided with the minimum required personal protective equipment (PPE) and ensure appropriate use, the equipment is maintained and kept clean and not taken home. The incinerator operator should:

- Follow the incinerator operations procedure.
- Use protective equipment when handling waste.
- Ensure an adequate supply of fuel is available.

- Record the weight and type of waste received.
- Follow the regular maintenance schedule for incinerator operation.

4.2 Private Public Partnership (PPP) in HCWM

Currently innovation and technology are spearheading development including products for use in health care facilities. There is more shift towards use of disposables than reusable in delivery of health care services resulting in increased volume of health care waste which eventually chokes the capacity of onsite disposal facilities leading to negative environmental impacts. Hence there is need to compliment onsite treatment with offsite which entails engaging private sector for collection and disposal where applicable.

It is therefore, important, to consider the following at facility level when engaging private sector on offsite health care waste management.

- Private sector to enter in this PPP should meet the requirements to handle health care waste through proper registration process and licensure with Malawi Environmental Protection Agency (MEPA) and City and District Councils.
- Identify an adequate, secure and water proof storage site located closer to temporally infectious waste storage.
- Maintain a properly executed HCW segregation program.
- Identification of potential HCW collectors with relevant permits from designated authorities
- Vehicles allowed to collect and transport HCW from facility must be of sufficient volume, tonnage and able to conceal all waste from spillage and odour during transportation.
- Establish a consignment manifest system detailing, time, quantity/volume, route and final disposal site & identification of driver andr vehicle tracking(Must establish a safest and shortest route to final treatment or disposal site).
- Maintain an accurate record of HCW for off-site disposal through PPP. (weight or volume, type, and time and identification of the collector.
- Must have a schedule for HCW collection
- Must have a well-established and approved disposal sites.

- Waste handlers engaged in offsite HCW collection and transportation must use recommended PPE.
- Materials sourced from private sector must be within recommended standards and specifications
- Always maintain a backup storage and or final onsite disposal alternativefor delayed collection.

CHAPTER 5: MANAGEMENT OF BLOOD AND BODY FLUID SPILLAGES

Introduction

Dealing with spills of blood or other body fluids may expose the health care worker to blood-borne pathogens. This guideline aims to reduce the risk of exposure to potentially hazardous microorganisms by outlining a safe procedure for dealing with these spillages.

Why manage blood and body fluid spillages?

Blood and body fluids are considered hazardous as they may contain infectious microorganisms and should be dealt with immediately.

Body fluids include:

- Blood
- Respiratory and oral secretions
- Vomitus/gastric aspiration
- Vaginal secretions
- Amniotic fluid
- Faeces
- Urine
- Wound drainage
- Seminal fluid sample
- Cerebrospinal fluid sample
- Pleural fluid
- Breast milk

NB: depending on the type of spillage it may be necessary to do a risk assessment and report any incident or near miss to the Occupational Health and Safety Team (OHST).

Spillages are highly unpredictable and can occur in a wide variety of settings. All spillages of blood or body fluid should be considered as potentially infectious.

It is essential, that all staff receive training in spillage management and that appropriate equipment is readily available in healthcare settings

Spillage Cleaning

Always use standard infection control precautions and carry out a risk assessment of the type of personal protective equipment (PPE) required.

Spillages in the patient care areas

Standard precautions and good hand hygiene should still be adhered to. Use absorbent material at hand. Clean area with a solution of detergent and warm water and disposable clothes and then dispose of waste.

Cleaning spills of blood and body fluids on surfaces.

Clean up spills of potentially infectious materials immediately. Besides preventing the spread of infections, prompt removal also prevents accidents. Staff cleaning spills must wear appropriate PPE. Cleaning agents should be readily available for spills and should be stored and sign -posted in an area known to all staff. All facilities must have a spill kit.

Procedure for spill management will depend on the following:

- Nature of the spill, e.g. blood, urine and faeces.
- Possible pathogens that may be involved.
- Size of the spill i.e. spot, splash, large spill.
- Type of surface involved i.e. linoleum, carpet, wood, laminated, etc.
- Area involved i.e. preparatory laboratory, teaching areas, common access areas, etc.
- Likelihood of bare skin contact with the soiled area.

Small spills

Clean and disinfect using disinfectant.

Large spills

- First remove the visible organics matter with absorbent material e.g. disposable towel or paper and
- Discard into an appropriate leak-proof bin. Clean with soapy water, plain water and disinfect with 0.5% chlorine or any other disinfectant available, allow to air dry.
- Follow manufactures instruction.

Large spills of concentrated infections materials

- If it is a large spill of concentrated infectious materials, scoop the spill, clean then disinfect with chlorine solution.
- Protect the area using a signage so that it does not create a hazard where someone could slip on the wet floor and get hurt.
- Do not place a rag over the spill for cleaning up later, someone could easily slip and fall on it.
- Items used for cleaning must be cleaned. Items such as mops, buckets, and dusters should be cleaned, disinfected and dried before reuse.
- Hands should be thoroughly washed and dried after gloves are removed.

Spillages of Blood and Body Fluids in Vehicles

All vehicles transporting specimens must carry a spillage kit containing disinfectant, personal protective clothing, absorbent material and a clinical waste bag.

Guidance for Hazardous Waste Spill Clean-up in Laboratories

Chemical spills and accidents need to be minimized as much as possible. If a chemical spill should occur, a quick response with a stocked chemical spill kit will help minimize potential harm to personnel, equipment and laboratory space. This guidance document provides a list of the minimal equipment required for a spill kit. You may add equipment to the kit, provided all personnel are proficient in its use. An example would be adding a metallic mercury spill kit.

Note that the majority of chemical spills can be prevented or minimized by:

- Maintaining a neat and organized work area

- Performing a laboratory procedure review prior to conducting new experimental procedures
- Storing liquid chemicals in secondary containment bins
- Keeping reagent chemical containers sealed or closed at all times, except when removing contents;
- Ordering reagent chemicals in plastic or plastic coated glass containers whenever possible;
- Using secondary containment to store and move chemicals.

Liquid Spills other than flammable liquids

- Spread the chemical spill powder over the spill starting with the edges first. This will help to confine the spill to a smaller area.
- Spread enough powder over the spill to completely cover the liquid. There should be no free liquid.
- Use plastic scoop to ensure that the liquid was completely absorbed by the powder.
- Pick up the powder with scoop and place in the polyethylene bag.
- Wipe the area down with a wet paper towel.
- Dispose of paper towel with the waste generated from the spill clean-up. Seal bag with tape and attach a completed UT hazardous waste label on the bag.

CHAPTER 6.0 Management of hazardous wastes sources

Radiology departments generate waste not typically found elsewhere in healthcare.
Hazardous waste in radiology includes unused radiation producing units, radioactive materials, products contaminated by radionuclides for diagnostic material or therapy and other materials
Radiation producing materials include materials used machines, tubes and generators and radionuclides.

Sealed radioactive sources have been used globally for many decades in a wide range of applications in medicine, industry and research. If not properly managed and disposed of, such disused radioactive sources pose a potential health hazard to the public for periods, depending on

the half-life and activity level of the radionuclides, which may extend to hundreds or thousands of years. They can also present immediate security concerns.

1. **Disposal of X-ray Units and Tubes**

- When an old disused x-ray unit cannot be returned to the manufacturer or supplier, the waste may be disposed of as scrap metal or at a waste landfill site provided that the x-ray tube does not contain beryllium.
- When there is any doubt that the x-ray tube might contain beryllium, the unit must be treated as if it contains beryllium and use the procedure for disposal of material containing beryllium.
- When the X-ray Tube Contains beryllium, special consideration should be taken because the Environment Management (Chemicals and Toxic Substances Management) Regulations classify beryllium as a UN Class 9 dangerous substance Code H11 with toxic characteristics that must be controlled.
- Guidance on the management of hazardous waste containing beryllium must be obtained from Environmental Affairs Department (EAD) and the Malawi and the Environmental Protection Authority (MEPA).
- All other x-ray parts rendered non-functional should be disconnected to power sources, and donated for scrap recycling of the metals or other parts.

2. Disposal of radionuclide waste

Radionuclide materials are also used in many medical applications for both diagnosis and treatment. These materials have potential hazard to people and environment if poorly disposed. The management of radioactive waste involves collection and disposal.

Storage and disposal must ensure protection of people and environment from such hazards.
The radioactive waste should be identified and segregated within the area of work. Solid radioactive waste put in Foot operated bins, lined with disposable polythene while liquid waste be put in polythene carboys.

Package is monitored and labelled for the activity level before deciding upon the mode of disposal. Combustible radioactive waste should be segregated from non-combustible waste.

3. **Liquid radioactive waste**

   Liquid radioactive waste with activity less should be disposed of into the sanitary sewerage system with adequate flushing with water following the disposal.

4. **Radioactive waste with medium activity**

   Radioactive waste with medium activity should be stored in properly ventilated storage room with an exhaust system on roof exit. Storage space should have lead shielding of appropriate thickness (10 HVL) to prevent radiation leakage

5. **High activity and long half-lives radioactive materials**

   In rare cases, radioactive materials with very high activity levels and for those with long half-lives (longer than a month) should be disposed by delay and decay method. The waste is collected in suitable designed and labelled containers and buried in exclusive sites designed by competent authority.

   The waste is then monitored for the residual activity and if the dose limit is low it is disposed of as low activity solid or liquid waste.

6. **Insoluble liquid waste**

   Insoluble liquid waste such as vials, syringes, cotton swabs, tissue papers should be disposed of by incineration to reduce the bulk of waste and concentrate the activity is in a smaller volume of ash for further disposal.

7. **Disposal of volatile gaseous radioactive waste**

   The containers of such radioactive substances such are Xenon-133, Carbon-14, Hydrogen-3, Nitrogen-13, Technetium-99m aerosols should be opened under fume hoods connected through duct lines to highest roof top exit. Before the vapours are diluted and dispersed into the atmosphere, they should pass through charcoal and particulate air filters. Hospitals using radioactive gases should have efficient laminar airflow system

8. **Disposal of excreta and urine of patients containing radioactive substances.**

Disposal of excreta and urine of patients who have been administered high doses of radioisotopes should be flushed through the shortest route possible into customized storage tanks, called delay tanks for storage before dispersal into the sewerage system. The delay tank should be located in an area where there is minimal movement of public. The tank should be leaking proof, corrosion free. The full tank is kept closed for the period of one month. The effluent before released into the public sewerage system, a sample is collected to check the activity. If the activity is high it is kept for a year

9. **Disposal dead body with high levels of radioactivity**

Disposal of corpse depends on degree of radioactivity. If the body has radioactivity less than the safe limit the dead body may be handed over for disposal through burial or cremation without precautions. In case, the level of radioactivity is high, the corpse is retained in the hospital mortuary until the activity decays to safe limits

10. **Disposal of X-ray Film Processing Waste**

Most radiology facilities utilise x-ray equipment with digital image processing capabilities. However, radiology facilities that still utilise conventional imaging technology using chemicals such as developer, fixer and equipment cleaner must incorporate appropriate handling and storage procedures. These can be as disposed of as follows follows:

a) Disposal of used Developer

Contains hydroquinone, which is toxic until used. Once it has been used, it is safe to dispose of as regular municipal garbage. While used x-ray developer is considered safe, unused developer poses major hazardous risks. The best practice for disposing of unused developer is to put it into a separate labelled container, and send it back to its manufacturer.

b) Disposal of used Fixer

X-ray Fixer is classified as a hazardous waste due to a high concentration of silver. Spent X-ray fixer contains high levels of silver in the solution that settles in the sludge when disposed of in wastewater. Used fixer must therefore never be poured down drains, septic systems and regular rubbish bins. Silver from used fixer can be recycled either using on-site treatment at facilities where available or at of-site treatment and disposal plants. When only small quantities of fixer are generated by facilities, it may be more cost-effective to transport it to an off-site facility for silver removal and recycling.

c) Empty processing chemicals bottles

Processing bottles should be punctured and placed in a sealed plastic bag before disposal and not used as drinking water containers

d) Disposal Films

Radiographic film that is unused must not be disposed of with other general waste at the facility as it contains unreacted silver which can be toxic in the environment. Similarly, used film must also not be disposed of in general waste because it may contain significant amounts of silver depending on the object it was used to expose.

Old film can be managed by returning to the supplier or to hazardous waste management facilities that have the technical capacity to recycle or dispose of the material safely.

11. Materials and Waste Containing Lead

Radiology facilities may generate considerable amounts of lead waste including housings, lead rubbers, foils, shields and aprons. Lead has well documented adverse impacts on human health and the environment. Waste material and equipment from radiology that contains lead be collected and stored in labelled air-tight containers labelled “hazardous waste” awaiting appropriate disposal. All the material containing lead must be returned to the manufacturers, scrap dealers or other hazardous waste management facilities that have the technical capacity to recycle or dispose of the material safely.

CHAPTER 7.0 MONITORING AND EVALUATION

Monitoring is an organized method of systematically identifying, collecting, analysing, reporting, disseminating and utilizing information related to HCWM activities. Evaluation systematically and objectively determines the significance of an HCWM intervention, strategy and policy.

The main aim of monitoring and evaluation is to assess the extent to which standards are being met and activities are being performed according to the set objectives and indicators.

There are three key indicators that can be used to report on the impact of an HCWM programme.

Input indicators

Local or national guidelines are being followed e.g. the percentage of facilities with appropriate systems etc.

Process indicators

These rate how well individuals follow facility-based guidelines, but may also include how many individuals were trained on policy implementation e.g. number of people trained in HCWM.

Outcome indicators

These indicators measure the outcome that HCWM programmes are trying to prevent, health care associated infection e.g. the facility's infection rate from surgical site infections, urinary tract infections in catheterised patients and rates of antibiotic-resistant infections.

Though monitoring activities should cover all the components of the health care waste management process - inputs, activities/processes, outputs, outcomes and impact, HCWM monitoring in health facilities usually focus on inputs, processes, outputs and outcomes. These components are briefly described below.

Structures

Structures are HCWM resources that are necessary for effective performance. It includes qualified personnel, policies, guidelines and protocols, funds, supplies and equipment. Though it is important to monitor all inputs, for practical purposes, monitoring should be limited to a list of agreed tracer inputs.

Process/ activities

These are actions necessary to transform given inputs into planned outputs within a specified period of time. Processes comprise the step-by-step activities that are performed. Examples of HCWM processes are handling of waste and placing in proper storage equipment, collecting receptacles and transporting to a treatment or disposal equipment/site.

Output

Output refers to the amount of work done. Examples are number of staff trained, number of supervisory visits etc.

Outcome

This is the end result of an activity or set of activities that provides value to the client. It is dependent on the quality of inputs, process and outputs. Examples are client satisfaction with cleanliness of health facility, change in HCWM knowledge and skills, attitude and behaviour.

Monitoring can be both internal and external. Internal monitoring involves a system set up by the health facility/wards/units and uses people within the health facility/ward/unit to undertake the exercise. External monitoring is one that is conducted by people from outside the health facility and could be from the MOH or outside the country. In both types of monitoring, agreed standards will be used.

Monitoring and evaluation responsibilities

National Level

- The purpose of monitoring at the national level is to assess the overall performance, identification and implementation of relevant interventions to improve the quality of healthcare service.
- The central monitoring and evaluation division (CMED) is responsible for designing a national indicators which includes HCWM monitoring system.
- CMED should perform an annual evaluation to assess the extent to which the objectives are met.

District Level

The district HCWM focal persons are responsible for monitoring within the district.

The purpose of monitoring at this level is to identify gaps in performance at the various health facilities and support the implementation of relevant interventions to improve the quality of service.

Health centre/ward/unit level

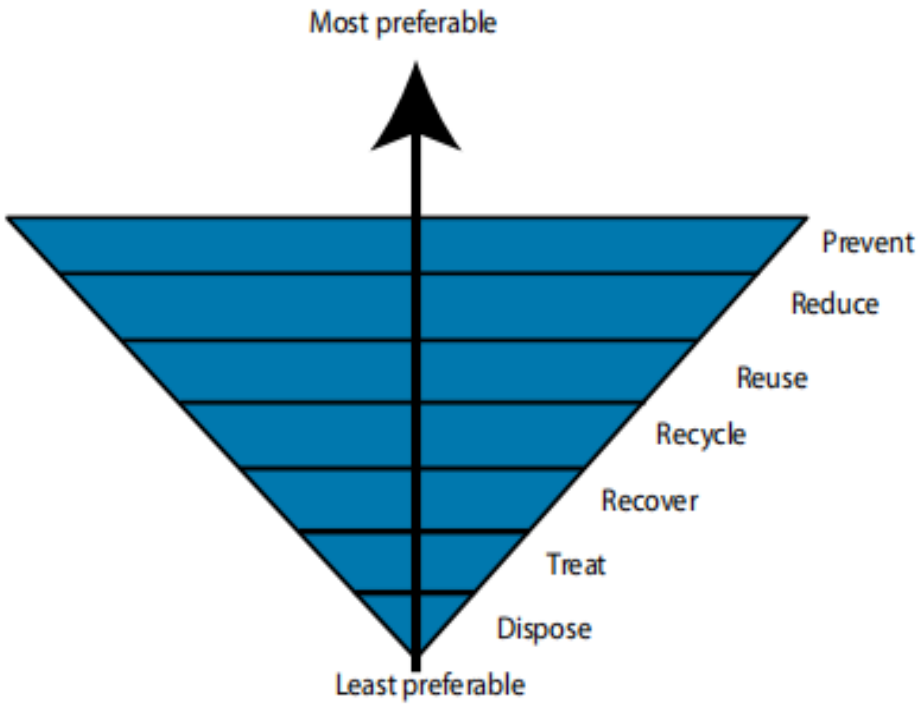
- The focal person(s) and the committee/team are expected to conduct a quarterly monitoring of HCWM activities.
- They should ensure that the appropriate structures, policies and procedures for monitoring are instituted and functioning.
- Tracking of set indicators.

6.2 Guidelines review

The guidelines will be reviewed every five (5) years and on need basis.

ANNEXES

ANNEX 1: WASTE MANAGEMENT HIERARCHY



ANNEX 2: DIAGRAM OF WASTE MANAGEMENT PROCESS

ANNEX 3: SAMPLE OF HCWM PROCESS

Sample Management Process for Common Health Care Waste								
Category & Examples of waste	**Generational point**	**Waste Minimization**	**Segregation**	**Collection**	**Transportation**	**Storage**	**Treatment**	**Disposal Methods**
Non Infectious waste • Paper • Plastics • food left overs	Offices Kitchen Wards	Recycling Prevent Reuse Stock management Purchasing reductions	Black bins	Bin liner Color coded bins	Wheeled Bins, carts. Wheelbarrow should be used for waste generated from hospital grounds	Internal & external	Controlled Burning Incineration	Safe burying Ash pit Landfills
Infectious waste • Blood • Body fluids • Laboratory waste	Surgical procedures Embalming Disinfection Laboratory processes	Following SOP's Developing formal waste management plan - refresher training	Color coded bins	Bin liner	Trolley, Wheeled Bins covered carts	Internal & external	Incineration Chemical treatment	Placenta pit Ash pit Sluice
Sharps • Needles • Blades • Broken vials	Vaccination Surgical procedures	Stock management Following SOP's	Sharp boxes/ containers	Sharp Container Sharp boxes	Sharp Container Sharp box	Internal & external	Autoclave Incineration	Ash pit

ANNEX 4: PERSONAL PROTECTIVE EQUIPMENT USED IN HCWM

PPE for incinerator operators

ANNEX 5: HEALTH CARE WASTE MANAGEMENT COMPLIANCE CHECKLIST

Compliance checklist

A waste monitoring checklist is used to check compliance of the medical facility to the health care waste management guidelines and standards. Use this checklist when performing regular inspections to ensure that proper management of the health care waste by all facilities in both public and private sectors.

Name of facility	
Department inspected	
Facility Location	
Supervision Date	

1. Does site have a written management plan for non-infectious, infectious and highly infectious medical waste (solid and liquid)?

YES ☐ NO ☐ N/A ☐

Comment:……..

2. Does site have designated HCWM focal person responsible for all steps in the waste management process?

YES ☐ NO ☐ N/A ☐

Comment:……..

3. Does site have appropriate and adequate supplies for health care waste management including decontaminants, colour coded bins, protective clothing?

YES ☐ NO ☐ N/A ☐

Comment: ……..

4. Does site have and use infection prevention job aids and medical waste management protocols e.g. WHO, etc.?

YES ☐ NO ☐ N/A ☐

Comment:……..

5. Segregation: Are there internal rules for appropriate separation of waste by type at the point of generation? (e.g., needles and sharps disposed of in special sharps containers, such as covered leak-proof, puncture-proof cardboard boxes, plastic bottles, or tin cans)?

YES ☐ NO ☐ N/A ☐

Comment:……..

6. Handling: Is there appropriate collection and transportation of medical waste within the facility (e.g., handling medical waste as little as possible before temporary storage and disposal; removing and emptying waste containers from operating, procedure, and sluice rooms before completely full, at least once a day; Observing good hygiene; and wearing protective clothing)?

YES ☐ NO ☐ N/A ☐

Comment:……..

7. Interim storage: Is medical waste appropriately and temporarily stored safely, packaged, and labeled within the facility (e.g., always for less than 24 hours, before disposal; stored in a designated, closed-off area that is minimally accessible to staff, visitors, and food; correct response for spills, injury, exposure is followed)

YES ☐ NO ☐ N/A ☐

Comment:……..

8. Treatment: Is health care waste treated appropriately (e.g. incineration, chemical treatment)?

YES ☐ NO ☐ N/A ☐

Comment:……..

9. Treatment: Does the health facility have an appropriate and functional incinerator?

YES ☐ NO ☐ N/A ☐

Comment:……..

10. Final disposal, general: Is health care waste disposed of appropriately (e.g., all solid and liquid waste and contaminated waste disposed of away from the community; never stored in open container; never thrown onto an open pile)?

YES ☐ NO ☐ N/A ☐

Comment:……..

11. If final disposal is off-site, are precautionary measures taken to ensure that waste is transported and disposed of safely?

YES ☐ NO ☐ N/A ☐

Comment:……..

12. Does the facility keep records of required issues on HCWM? Records should include amount of waste generated, types of waste generated, number of receptacles according to waste types, number

of treatment, incineration and disposal equipment/facilities, etc.

YES ☐ NO ☐ N/A ☐

Comment:……..

13. Are workers involved in HCWM adequately trained?

YES ☐ NO ☐ N/A ☐

Comment:……..

14. Does the facility use standard labels on receptacles, transport modes, treatment equipment etc?

YES ☐ NO ☐ N/A ☐

Comment:……..

15. Additional observations and comments on infection prevention and waste management:

……

……

……

……

……

……

16. Name and Signature of Supervision Personnel

Name …… Signature……..

Name …… Signature……..

Name …… Signature……..

Name …… Signature……..

17. Name and Signature of facility representative

Name ……

Signature……..

ANNEX 6: ACCIDENT/INCIDENT REPORT FORM

ACCIDENT INCIDENT REPORT FORM

Use this form to report accidents, injuries, medical situations, criminal activities, traffic incidents, or student behavior incidents. If possible, a report should be completed within 24 hours of the event.

Date of Report: [DATE]

1. PERSON INVOLVED

Full Name: [NAME] Address: [ADDRESS]

Identification: ☐ Driver's License No. [#] ☐ Passport No. [#] ☐ national ID : [OTHER]

Employment number

Phone: [PHONE NUMBER] E-Mail: [E-MAIL ADDRESS]

2. THE INCIDENT

Date of Incident: [DATE] Time: [TIME] ☐ AM ☐ PM

Location: [LOCATION]

Describe the Incident: [DESCRIBE THE INCIDENT]

3. INJURIES

Was anyone injured? ☐ Yes ☐ No

If yes, describe the injuries: [DESCRIPTION OF INJURIES]

4. WITNESSES

Were there witnesses to the incident? ☐ Yes ☐ No

If yes, enter the witnesses' names and contact info: [NAMES OF WITNESSES]

5. POLICE / MEDICAL SERVICES

Police Notified? ☐ Yes ☐ No If yes, was a report filed? ☐ Yes ☐ No

Was medical treatment provided? ☐ Yes ☐ No ☐ Refused

If yes, where was medical treatment provided? ☐ On site ☐ Hospital ☐ Other: [OTHER]

6. PERSON FILING REPORT

Signature: _____ Date: _____

Print Name: _____

OFFICE USE ONLY

Report received by: [NAME] Date: [DATE]

Follow-up action taken:

Action Taken: DESCRIBE]

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