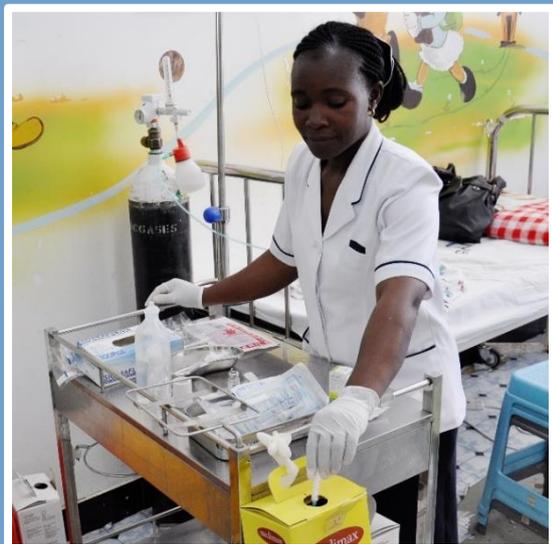




REPUBLIC OF KENYA
MINISTRY OF HEALTH



An Orientation Guide for Health Workers in Health Care Waste Management

Foreword

The Kenya Health Sector Strategic plan (KHSSP III) represents the 2nd Medium Term Plan of the Health Sector to support attainment of the Vision 2030. It is designed to provide an overall framework into which sector priorities and actions are derived. The Ministry of Health mandates on health care waste management is in line with objectives 5 and 6 of the health sector strategic plan, which are to minimize exposure to health risk factors and strengthen collaboration with health related sectors. Other objectives of the strategic plan are also inter-linked to health care waste management to ensure that professional services, commodities and equipment are up to required standards.

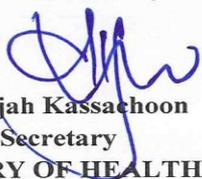
Recognizing the need to review the National Health Care Waste Management Plan 2008 – 2012, the Ministry and its strategic partners developed the new national strategic plan 2015 – 2020. To give effect to the strategic plan, a number of guiding tools, which include the standard operating procedures and the training manuals were developed. In line to providing continuous professional development and on job orientation to new health workers, this Orientation Manual on Health Care Waste Management was developed.

This orientation guide is divided into four parts, namely the overview to HCWM, workers safety, roles and responsibilities of health care workers and a brief on policies, laws and procedures in HCWM. The orientation guide is an immediate resource to the health care workers whilst in their day-to-day service delivery at various health settings. Its goal is to strengthen the capacity of the health workers and support staff in the management of health care waste in all health settings in order to improve public health and realize sustainable environment. It is important to note that poor practices in health care waste management significantly contribute to the burden of health care associated infections. Health workers and support staffs are particularly at the most risk. It is therefore important that proper waste management practices are promoted including through continuous professional development in health care waste management

The Ministry, therefore, encourages the use of this orientation guide during formal and informal facility-based continuous medical education sessions. It is a guide for the health workers to continuously appreciate, manage and monitor appropriately and professionally as required the health care wastes through proper segregation, handling and collection, transportation, treatment and disposal while in their day to day service delivery practices.

The development of this On Job Training Manual was an initiative of the Ministry of Health made possible through the financial and technical support from its strategic development partners on health care waste management. This support was made possible through the PATH and the US Centers for Disease Control (CDC) through financial support from the U.S President's Emergency Plan for AIDS Relief (PEPFAR).

Finally, the Ministry is grateful to its staff, other strategic development partners, and other stakeholders in the area of health care wastes and other wastes for their contributions either technically or financially toward the development and roll out of this orientation guide.



Dr Khadijah Kassachoon
Principal Secretary
MINISTRY OF HEALTH

Preface

This On-Job Training manual for health workers has been produced as a result of the need to prudently manage healthcare waste arising from the healthcare industry as well as safeguarding healthcare workers from the risks and infections associated with such wastes. It is derivative of the healthcare waste management policy and guidelines.

The emergence and re-emergence of diseases such as HIV/AIDS, hepatitis B and hepatitis C with high per capita consumption of medical commodities and subsequent generation of hazardous waste has made the development of this manual inevitable. Further, large volumes of potentially hazardous waste can pollute the environment and consequently be injurious to health.

The on-job use of this manual for orientation and training of healthcare facility managers, waste handlers and incinerator operators, among other healthcare management teams, will go a long way in creating awareness on the need for safe management of healthcare waste.

This manual will be made available for use within the wider healthcare industry. The Ministry therefore encourages all partners and stakeholders to support its dissemination as well as regular use during continued medical education sessions.



Dr. Nicholas Muraguri,
Director of Medical Services

Acknowledgment

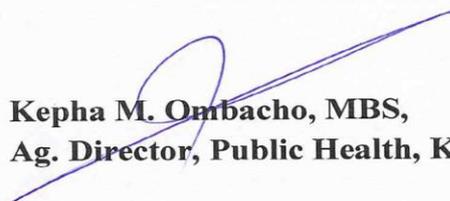
This **On-the-job training (OJT)** Guide was developed through participatory process which involved various individuals and institutions. The Ministry of Health wishes to acknowledge and thank everyone for their participation and contributions, without which this document would not have been completed. The ministry acknowledges the management and staff of five hospitals namely the National Spinal Injury Hospital, Mbagathi District Hospital, Mama Lucy Kibaki Hospital, Murang'a District Hospital and Kiambu District Hospital where this guide was pre-tested. Their participation and feedback were useful in refining the final document.

Appreciation goes to the following institutions and organizations for providing staff that formed the core team which developed the guide: The Ministry of Health, Division of Environmental Health and Sanitation, Kenyatta National Hospital, Kenya Medical Training College, Kenya Medical Research Institute and Mbagathi District Hospital.

Additionally, I would wish to appreciate the following members of the task force for their tireless efforts towards the development of this on-the-job training (OJT) manual. They are: L. Lokolile (focal person), J.G. Muriithi and M. Mwanja (MOH), S. Matu (KEMRI), J. Katama (KNH), C.Obiero (KMTTC), J. Mwita and M. Maitima (Mbagathi District Hospital).

Special acknowledgements go to Janet Shauri for driving the agenda forward during the review. Further F.M.Okuku, Adriane Berman and G. Ng'eno (PATH) deserve special gratitude for their technical support.

Finally, the Ministry acknowledges and appreciates the President's Emergency Plan for AIDS Relief (PEPFAR), the Centers for Disease Control and Prevention (CDC) and PATH for the financial and technical support.



**Kepha M. Ombacho, MBS,
Ag. Director, Public Health, Kenya**

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Citation

An Orientation Guide for Health Care Service Providers in Health Care Waste Management
Ministry of Health
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Acronyms

CDC	Centers for Disease Control and Prevention
HCW	health care waste
HCWM	health care waste management
IPC	infection prevention and control
KEMRI	Kenya Medical Research Institute
KHSSP III	Kenya Health Sector Strategic Plan III
KMTC	Kenya Medical Training College
KNH	Kenyatta National Hospital
MSDS	material safety data sheet
OJT	on-the-job training
PEP	post-exposure prophylaxis
PEPFAR	US President's Emergency Plan for AIDS Relief
PPE	personal protective equipment

Health care waste management overview

Definition of health care waste

Health care waste (HCW) is the total waste stream generated from health care facilities including hospitals, research centres, and laboratories.

HCWM is the classification, collection, transportation, treatment, and disposal of waste including the supervision of such operations and aftercare of disposal to ensure it doesn't cause harm/ injury to persons.

Importance of health care waste management

- To minimize the effect of waste on public health, such as disease transmission (e.g., HIV/AIDS, hepatitis B, and hepatitis C) and injuries caused by sharps.
- To prevent risks and hazards to waste-handling staff.
- To reduce the environmental impact caused by pollution resulting from improper disposal of waste, including contamination of grounds, water, and air.
- To reduce the costs resulting from waste handling.
- To facilitate resource recovery of useful products (reduce, reuse, recycle).
- To prevent and control breeding of insects, rodents, and other pests.
- To reduce nuisances (e.g., smell, unsightliness).
- To prevent animal and human scavenging.
- To improve on aesthetics and ensure the hospital is a beautiful environment.

Categorization of health care waste

The National Guidelines for Safe Management of Health Care Waste includes the following categories of waste:

Infectious waste (e.g., tissues, materials, or equipment that have been in contact with blood or other body fluids).

- Pathological waste (e.g., tissues, organs, body parts, blood, infected animals from laboratories, and body fluids).
- Sharps (e.g., needles, hypodermic needles, scalpels, and other blades, knives, infusion sets, saws, and broken glass).
- Pharmaceutical waste (e.g., expired, spilt, and contaminated pharmaceutical products, discarded bottles or boxes with residues, and drug vials).
- Radioactive waste includes solid, liquid, and gaseous materials contaminated with radionuclide.
- Genotoxic/cytotoxic waste may include certain cytotoxic drugs often used in cancer therapy, vomit, urine or feces from patients treated with cytotoxic drugs, chemicals, and radioactive material.

- Chemical waste consists of discarded solid, liquid, and gaseous chemicals (e.g., from diagnostic and experimental work and from cleaning, housekeeping, and disinfecting procedures).

Waste with heavy metal content includes waste containing mercury, cadmium, lead, and drugs containing arsenic, among others.

- Non-infectious/general waste includes waste generated from offices, kitchens, packaging material, and from stores. It is similar to domestic waste.
- Other wastes generated from health care settings include:
 - Electronic waste.
 - Construction waste.
 - Obsolete equipment/furniture.

Principles of health care waste management

The general principles to be followed for HCWM are:

- The “Duty of Care” principle: stipulates that any person handling or managing hazardous substances or related equipment is ethically responsible for using the utmost care in that task.
- The “Proximity” principle: recommends that treatment and disposal of waste should take place at the closest possible location to its source in order to minimize risks linked to the transport of waste.
- The “Precautionary” principle: governs health and safety protection. When the magnitude of a particular risk is uncertain, it should be assumed that this risk is significant, and measures to protect health and safety should be designed accordingly.
- The “Polluter Pays” principle: implies that all producers of waste are responsible for the safe and environmentally sound disposal of the waste they produce.

Summary of key steps in health care waste management

Minimization: Refers to approaches adopted by the health facility to reduce the amount of HCW generated during delivery of services. It includes strategies to reduce unnecessary injections, as well as to recycle or reuse some of the materials.

Segregation: Refers to placing HCW into separate containers according to type: non-infectious or general waste, infectious, highly infectious, and sharps waste.

Handling and storage: Refers to steps taken to manage waste during containment and storage whilst waiting for collection or transportation to a treatment plant or disposal site.

Collection and transport: Refers to an organized system for removing waste from the point of generation or temporary storage to a treatment or disposal site. Waste may be transported within the health facility or to an offsite treatment plant and disposal site.

Treatment: Refers to rendering HCW safe for handling and final disposal. Some of the methods used include:

- Incineration: burning at high temperatures in an incinerator—850°C to 1100°C (Demontfort 600°C to 700°C).
- Sterilisation using autoclave or microwave technology.
- Chemical disinfection: treatment methods using a chemical such as hypochlorite solution (jick) to render the waste safe.
- Shredding waste using mechanical grinders to break it down into unrecognizable pieces. This method does not treat infectious waste and should be used in conjunction with sterilization.
- Macerators for anatomical waste fall in this category of treatment.

Disposal: Refers to the final discharge of waste and residues or by-product from the treatment of waste. Some of the common methods of disposal are:

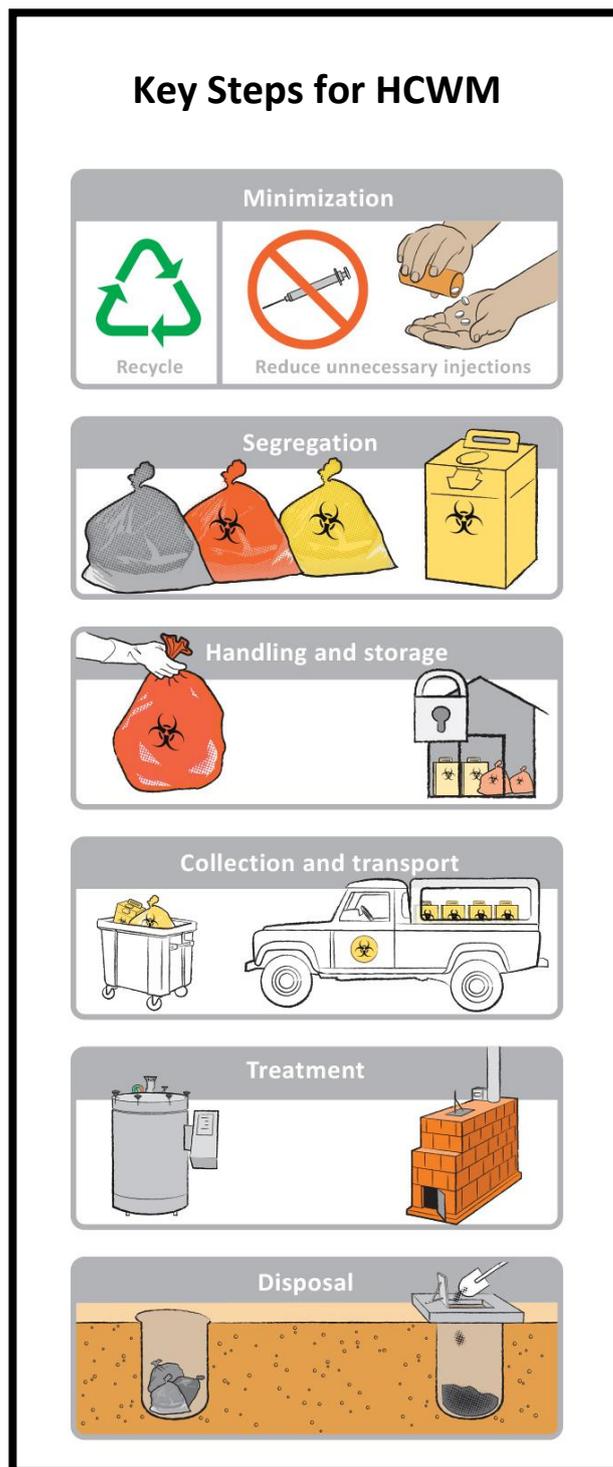


Figure 1. Key steps for health care waste management

- Municipal landfills: this is a designated site for disposal of municipal waste in a controlled manner to minimize pollution to ground water, land, and air.
- Burial in pits: for example, infectious waste pit, placenta pits, ash pit.

*Please note that incineration is not a disposal method because the ash residue then has to be disposed of either in a protected ash pit or municipal landfill.

Minimization of health care waste

Waste minimization is the prevention of waste production and/or its reduction. Health care service providers and facility administrators can play an important role in the reduction of waste volume. Waste minimization is directly proportional to waste management costs and related risks.

How to minimize waste

Health facilities can adopt many policies, facility guidelines, and practices that may reduce their waste volume. Some policies include:

- Source reduction—purchasing and supplying materials which are less wasteful and/ or generate less medical waste.
- Stock management—frequent auditing; use of the oldest stock first and checking the expiry date of products during receiving and issuing of commodities.
- Encouraging the use of recyclable products—using materials that can be recycled both off- and onsite.
- Centralized purchasing, supply and monitoring of medical goods—reducing the costs and waste.
- Segregation of waste at the point of generation—sorting the waste into different categories, helping to minimize the quantities of hazardous waste.
- Reducing the number of unnecessary injections—increased use of oral medication instead of injectable.

Segregation of health care waste

Segregation refers to placing HCW into separate containers according to type or categories (e.g. non- infectious or general waste, infectious, highly infectious, and sharps waste).

Why segregate waste?

The segregation of waste has the following advantages:

- Facilitates the safe handling of the waste.
- Separates recyclable waste from hazardous waste.
- Ensures that the waste will be treated according to its hazards.
- Reduces the overall cost of waste management, including transport, treatment, and disposal.

Segregation categories

Health care workers should segregate HCW immediately at the point of generation according to the type of waste. The national HCW segregation chart has the following categories:

- General or non-infectious waste.
- Infectious waste.
- Highly infectious or anatomical/pathological waste.
- Sharps waste.

Individual health facilities may include other categories in addition to the above, such as food remains, bottles, etc. This can promote recycling or reuse of materials that may have potential value for resale.



Figure 2. HCW bins, safety box, and segregation poster

Table 1. Categories of health care waste

Category	Examples	Colour of Bin and Liner	Marking
General or non-infectious	Paper, packaging materials, plastic bottles, food, cartons	Black	No recommended marking
Infectious	Gloves, dressings, blood, body fluids, used specimen containers	Yellow	
Highly infectious or anatomical/pathological	Laboratory specimens and containers with biological agents, anatomical waste, pathological waste	Red	
Chemical	Formaldehyde, batteries, photographic chemicals, solvents, organic chemicals, inorganic chemicals	Brown	Marking will vary with classification of the chemical

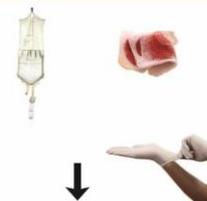
Radioactive	Any solid, liquid, or pathological waste contaminated with radioactive isotopes of any kind	Yellow	 Radioactive symbol
Genotoxic/ Cytotoxic	All drug administrative equipment (e.g., needles, syringes, drip sets), gowns and bodily fluid/waste from patients undergoing cytotoxic drug therapy	Purple	 BIOHAZARD

Figure 3. Segregation of HCW poster


KENYA

SEGREGATION OF MEDICAL WASTE

PREVENTION OF NEEDLE STICK INJURIES AND RISK OF DISEASE TRANSMISSION STARTS WITH YOU!

General waste	Infectious waste	Pathological waste	Sharp Waste
Paper Packaging material Food  	Gauze/dressing Used IV/ fluid lines Used gloves Infusion set  	Anatomical waste - Teeth - Placenta Pathological waste - Sputum container - Test tube containing specimen  	Cannula/branula Retractable Broken slides Scalpels Broken vial Blades Broken ampules Needles Lancet Suture needles  

IT IS THE RESPONSIBILITY OF HEALTH PERSONNEL TO SEGREGATE WASTE IMMEDIATELY ACCORDING TO TYPE
This segregation chart should be placed above the segregation bins

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This material was developed by MMIS and has been revised by PSI in collaboration with PATH.
PATH's, HCWM project has received support for printing from the U.S. Centers for Disease Control through PEPFAR


PEPFAR

Sharps waste management

Sharp waste must be immediately contained after use in order to prevent injury.

- The primary way to contain sharps is by using safety boxes and needle removers when available in the health facility.

- A safety box is a puncture- and leak-resistant container for disposal of sharps.

Why use a safety box?

Sharps can cut or puncture the skin, and, if they are contaminated, they can cause infections or diseases, including hepatitis B, hepatitis C, and HIV. If not properly disposed of, scavengers may also collect and reuse sharps waste. Reusing syringes and needles results in high risk of infection or disease transmission.

Tips on how to use a safety box

- Follow assembly instructions printed on the box.
- Keep safety box within arm's reach at each place where injections are given.
- Remove cannula/needle from IV set and place sharp in safety box.
- Dispose of the used syringe into the small opening in the safety box immediately after use.
- Do not recap and do not collect syringes for later disposal.
- Fingers should never be placed inside the box.
- Close the flap on the small opening of the box when it is three-quarters full. Do not overfill.
- Fill safety box only once and then destroy.

What goes in a safety box?

- Syringes with needles.
- Syringes with needles removed (if using a needle remover).
- Infusion needles.
- Cannula.
- Suture needles.
- Scalpels.
- Blades.
- Broken ampoule.
- Other categories of sharps and cannulas should be disposed of in specially designed sharps containers. These include:
 - Chest tube introducers.
 - Biopsy needle.
 - Central line introducer.
 - Cord clumps.
 - Fistula needles.

Remember!

- Health care workers should segregate waste at point of generation.
- Waste should NEVER be re-sorted.
- Seal all waste containers and label them to describe contents.

Handling and storage of health care waste

Handling of health care waste

Handling is the process of packing and moving waste materials at the points of generation. It is done by generators and handlers of waste as it entails holding pieces of waste in bins located near the points of waste generation

In general, the following measures should be taken when handling HCW:

- Health workers handling waste must wear appropriate personal protective equipment (PPE) when handling waste.
- Sharps must always be placed in injection safety boxes and never be placed in waste bags.
- Waste must be contained in colour-coded and well-labelled plastic bags.
- Waste bags must not be overfilled (fill to approximately three-quarters of capacity).
- The volume of waste bag should not exceed 55 litres.
- At the point of waste generation, excess air should be expelled from the bag without compacting the contents, prior to closure using a bag tie.
- All bags should be held away from the body by the closed top of the bag, and placed directly into a mobile garbage bin or trolley.
- Where waste bags are sealed and stored pending collection, they should be in a secure place with restricted access.
- A waste collection schedule should be in place.

Storage of health care waste

Storage is the temporary containment of waste in a secured area before collection for treatment and/or disposal. Storage requirements must meet the criteria set by technically trained personnel.

- The storage time must not exceed 24 hours.
- Any storage of waste, including sharps, before treatment or collection for offsite disposal should be in a secure location designated for the purpose.

Recommendations for the transfer station/storage area and its equipment:

- There should be a water supply for cleaning purposes.
- The area should be clearly demarcated and have a sign warning trespassers.
- The storage area should have impermeable, hard-standing floor with good drainage; it should be easy to clean and disinfect.
- The storage area should afford easy access for staff in charge of handling waste.
- It should be possible to lock the storage area to prevent access by unauthorized persons.
- Easy access is required for waste-collection vehicles.
- The area should have protection from the sun.
- The storage area should be inaccessible to animals, insects, and birds
- There should be good lighting and ventilation (passive ventilation at a minimum).

Collection and transportation of health care waste

Collection of health care waste

Collection is the assembly of waste packages from different sections to one point. Collection is meant to avoid accumulation and decomposition of waste in an area.

Guiding principles in collection of waste include:

- Remove waste liner bags from the service point and take them to a storage or disposal area.
- Waste should not be allowed to accumulate at the point of production. For this reason, a routine schedule for waste collection should be established as part of the HCWM plan.
- Health care workers should ensure that waste liner bags are tightly closed or sealed when they are about three-quarters full.
- Light-gauge liner bags can be closed by tying the neck, but heavier-gauge bags probably require a plastic sealing tag of the self-locking type.
- Liner bags should not be stapled closed.



Figure 4. Waste handler collecting infectious waste.

Recommendations to be followed by waste handlers in charge of waste collection:

- Waste should be collected daily (or as frequently as required) and transported to the designated central storage site.
- Liner bags should be labelled at the point of production, indicating the department or ward or point of generation. The liner bags should be replaced immediately with new ones of the same type.
- The waste containers and trolleys should be regularly cleaned and decontaminated after use.
- A supply of fresh collection liner bags or containers should be readily available at all locations where waste is produced.
- The person in charge should ensure that adequate supplies (three months' worth) are available and that procurement is timely to ensure the facility does not run out of the liner bags.

Transportation of health care waste

Transportation refers to moving collected wastes from temporary storage area to treatment or disposal site. HCW can be transported to a treatment site within the hospital (known as “onsite”) or outside (known as “offsite”).

When moving waste from one place to another—either onsite or offsite—the following precautions should be taken:

- Boxes of waste must be kept upright; avoid direct contact of safety boxes with other waste or medical supplies in the same vehicle.
- Safety boxes must be kept dry.
- All health workers should be aware of the waste-collection schedule.
- Waste should be placed in collection points to ensure that the waste handlers do not enter the wards/departments as they move en route.
- Health facilities should have a clearly defined route for transportation of waste. The transport routes should avoid food preparation and heavily used areas.
- After transport, decontaminate and clean vehicle surfaces.
- HCW should be transported in designated vessels only.

Treatment of health care waste

Treatment is the process of rendering HCW safe by reduction or elimination of the potential to cause harm and reduction of the volume. HCW should be treated prior to disposal to ensure protection from potential hazards posed by the waste. To be effective, treatment must reduce or eliminate the risk present in the waste so that it no longer poses a hazard to persons who may be exposed to it.

The common methods of treatment are incineration, steam sterilization, chemical disinfection, autoclaving, and microwave irradiation. Other methods that can be used include encapsulation and inertization, shredding, and placenta maceration.

Laboratory infectious products must be pre-treated at the point of generation as per the National Biosafety and Biosecurity Guidelines.

Disposal of health care waste

Disposal refers to the final discharge of waste and residues or by-product from the treatment of waste. Municipal landfills are a designated site for disposal of municipal waste in a controlled manner to minimize pollution to ground water, land, and air. Disposal can also be done through burial in waste pits, placenta pits, and ash pits. Liquid waste is discharged through the conventional sewer line.

Health worker safety

Any health worker who handles wastes is at potential risk of accidental injury or exposure to infections. Consequently, health workers are at risk of infection with bloodborne viruses including HIV/AIDS, hepatitis B, and hepatitis C. In addition, they are at risk of contracting other diseases and respiratory infections. Risk of infection for health workers depends on the prevalence of disease in the patient population, the nature and frequency of exposure, and their vulnerability.

To eliminate or minimize the risk of infection, health care facilities must institute good health and safety measures and ensure that all health care workers adhere to them.

Strategies to protect health workers include the following:

- Implementing standard precautions.
- Immunising all health workers against hepatitis B.
- Providing PPE.
- Managing exposures in a timely manner.
- Eliminating unnecessary sharps and injections.

Standard precautions are universally accepted practices adopted to promote safety of the health worker and prevent transmission of infections from person to person, surface to person, or object to person.

Hand hygiene

Hand hygiene is the single most recommended method of infection prevention. The purpose of hand hygiene is to remove soil, blood, other organic material, and transient microorganisms from the skin. Types of hand hygiene practised depend on settings and procedures carried out. Hand-washing is general/routine cleaning of surfaces of the hand using soap and water. The main steps are:

- Wet hands with water.
- Apply soap.
- Rub all surfaces.
- Rinse hands.
- Dry with single-use towel.

Hand-rubbing is the use of waterless, alcohol-based sanitizers on hand surfaces to kill transient and resident flora without use of water. Use sanitizers up to a maximum of five times per day.

Hand antiseptics are the use of an antiseptic detergent to clean hands. It may reduce infections in high-risk situations such as contact with highly susceptible patients.

Surgical hand scrub is practiced prior to performing any surgical procedure as a way of removing debris and transient microorganisms on the surface of the hand.

Indications for hand hygiene:

- Before and after touching a patient/patient surroundings or contaminated surfaces.
- Before clean or aseptic procedure.
- After body fluid exposure risk and removing gloves.
- When hands are visibly soiled.
- After personal functions—visiting toilet, blowing nose.
- Before preparing, handling, or serving food.
- After removal of PPEs.

Personal protective equipment

Protective barriers and clothing referred to as PPE provide a physical barrier between microorganisms and the wearer, thereby preventing microorganisms from contaminating hands, eyes, clothing, hair, and shoes. PPE also prevents microorganisms from being transmitted to other patients and staff.

PPE reduces, but does not completely eliminate, the risk of acquiring an infection. PPE must be used effectively, correctly, and whenever there is a risk of contact with blood and body fluids. Making PPE available and training health care workers to use it properly are essential.

Principles for using PPE

Health care workers should follow these guidelines for using PPE:

- Assess the risk of exposure to blood, body fluids, excretions, or secretions and choose items of PPE accordingly.
- Use PPE appropriately.
- Avoid any contact between contaminated (used) PPE and surfaces, clothing, or people outside the patient care area.
 - Do not share PPE.
 - Remove PPE after use without contaminating yourself and then perform hand hygiene.
 - Disinfect reusable PPE appropriately.
 - Discard disposable used PPE appropriately in designated disposal bags.

Health workers—what to wear:

Table 2. Types of PPE and their recommended uses

Type of PPE	Recommended Use	Person Protected
Gloves		
Clean gloves	When there is a reasonable chance of hands coming in contact with blood or other body fluids, mucous membranes, or skin that is not intact.	Service providers
Surgical gloves	Before performing invasive medical procedures (e.g., when inserting vascular devices or performing surgery).	
Heavy-duty gloves	Before handling contaminated waste items or touching contaminated surfaces.	
Caps, gowns, scrub suits, or aprons	When performing procedures with possible contamination. When handling patients with infectious disease. When handling contaminated waste.	Service providers and patients
Masks	When handling patients with airborne or droplet infections. When performing procedures with the anticipation of aerosols. When handling medical waste.	Service providers, patients, incinerator operators, and visitors
Goggles or glasses	Situations in which splashing of blood, body fluids, secretions, or excretions is likely.	Service providers
Mackintoshes, plastic or rubber aprons	Situations in which splashing or spillage of blood, body fluids, secretions, or excretions is likely. Contaminated waste.	Service providers
Closed boots or shoes	Situations in which sharp instruments or in which spillage of infectious agents is likely. Indicated in high-risk areas (e.g., nursery, theatre, burn unit, amongst others).	Service providers and patients
Sterile drapes	Major or minor surgical procedures.	Patients

Adopted from the *National Infection Prevention and Control Guidelines* for Health Care Services in Kenya.

Waste handlers—what to wear:

- Gloves: protect any cuts on hands and help protect against needle sticks.
- Boots or closed-toe shoes: protect feet from sharps and accidental spills.
- Aprons (rubber or plastic): keep germs off of clothes.
- Overalls: protect the waste handler's clothes from spillages.

- Goggles (plastic): when handling liquids, protect the eyes from accidental splashes.

Incinerator operators—what to wear:

- Heat-resistant gloves: protect hands from heat, protect any cuts on hands, and help protect against needle pricks.
- Boots or closed-toe shoes: protect feet from sharps and accidental spills.
- Aprons (rubber or plastic): keep germs off of clothes.
- Respirator: protects from inhalation fumes and particulate matter.
- Goggles (plastic): protect the eyes from accidental splashes.
- Helmet: protects the head from accidental flying objects.
- Overalls: protect the operator's clothes from spillages.

When to wear it:

- At all times when handling HCW.

Mortuary attendants—what to wear:

- Boots or closed-toe shoes: protect feet from sharps and accidental spills.
- Aprons (rubber or plastic): keep germs off of clothes.
- Surgical mask: protects from the aerosols and splashes.
- Goggles (plastic): protect the eyes from accidental splashes during mortuary procedures.
- Overalls: protect the operator's clothes from spillages.

Keep it in good condition:

- Always have an extra set of PPE.
- Clean PPE after each use.
- Leave PPE at facility; do not take home.



Post-exposure prophylaxis (PEP)

Health workers are at risk of accidental needle stick or other injuries from sharps. The World Health Organization recommends following the ten steps below after a needle-stick injury:

1. Allow the wound to bleed freely and wash the area with soap under clean running water (do not squeeze).
2. If blood or body fluids get in your eyes, splash eyes with clean water.
3. Immediately report the incident to a designated person.
4. Retain, if possible, the item involved in the incident; get details of its source for identification of possible infection.
5. Seek additional medical attention in an emergency health department as soon as possible, including evaluating the exposure for its potential to transmit HIV infection (based on body substance and severity of exposure).
6. Get counseling and testing.
7. Initiate PEP immediately or within 72 hours of exposure.
8. Record the incident in the PEP register.
9. Investigate the incident and identify and implement remedial action to prevent similar incidents in the future.
10. Follow up according to guidelines.



Figure 6. Protective clothing for waste handlers

Injection safety and management of sharps

The guiding principles of injection safety include:

- Reduce the use of unnecessary injections.
- Syringes, needles, or similar equipment should never be reused and should be disposed of at the point of care.
- Use other routes of administration of drugs (e.g., oral, as much as possible).
- If the use of sharp objects cannot be avoided, ensure the following precautions are observed:
 - Never replace the cap on a used needle.
 - Never direct the point of a used needle towards any part of the body.
 - Do not remove used needles from disposable syringes by hand, and do not bend, break, or otherwise manipulate used needles by hand.
 - Dispose of syringes, needles, scalpel blades, and other sharp objects in appropriate, puncture-resistant containers.

Housekeeping

- Wear appropriate PPEs when performing environmental cleaning.
- Environmental surfaces or objects contaminated with blood, other body fluids, secretions, or excretions should be disinfected and cleaned as soon as possible using standard hospital detergents/disinfectants (e.g., a 0.5% chlorine solution or a solution containing 1,000 ppm available free chlorine).
- Change cleaning solutions as per manufacturer's instructions and maintain cleanness of cleaning equipment.
- Clean floors and perform damp dusting of horizontal work surfaces at least once a day with clean water and detergent.
- Allow surfaces to dry naturally before using them again.
- Dry sweeping with a broom should be done.
- Cleaning should always be carried out from "clean" areas to "dirty" areas, in order to avoid contaminant transfer.
- Environmental disinfection should be done when necessary.
- Washing contaminated linen by hand should be discouraged.

Management of spillages

Accidental spillages of materials can be a serious hazard to health according to the circumstances and nature of the substances involved.

Biological spillage

- All biological specimens/body fluids should be considered potentially infectious. The main aim should be to contain, neutralise, and dispose of the material safely.
- Procedure for dealing with biological spillage:
 1. Seal off the immediate area to avoid others becoming involved or contaminated by the spillage.
 2. If hypochlorite is used in a confined area, ensure good ventilation.
 3. Put on plastic apron, gloves, face protection/mask, if required, and overshoes/boots. (Solutions used to neutralise the spillage will depend on the nature of the substance, and local advice should be sought).
 4. Limit the spread of fluid by absorbent disposable towelling. Discard the towels carefully into yellow plastic bags for incineration.
 5. Take care to avoid injury if broken glass is present.
 6. Dispose of sharp items into a sharps container.
 7. After the necessary disinfectant contact period, collect the absorbed spillage and discard into a yellow plastic bag or sharps box (if there is sharps debris).
 8. Remove and discard disposable protective clothing, together with any other contaminated non-sharp disposable materials. Wash and dry hands.
 9. Notify the public health officer in charge in case of a major spillage

Chemical spillage

Use the material safety data sheet (MSDS) for management of chemical spillage. The MSDS provides guidelines on the type of chemical, its handling and disposal.

Dealing with spillage of a dangerous chemicals (e.g., glutaraldehyde, xylene, and formalin, amongst others):

- Secure the affected area.
- Take appropriate precaution (your safety comes first).
- Notify the public health officer in charge or any other designated officer responsible for safety.
- Evacuate non-essential personnel from the area.
- Attend to persons who may have been contaminated.
- If the spilled material is flammable:
 1. Extinguish all naked flames.
 2. Turn off gas in the room and adjacent areas.
 3. Switch off all electrical equipment.
- Activate exhaust ventilation system if it is safe to do so.
- Secure the necessary items to clean up the spillage.

Roles and responsibilities in health care waste management

Everyone in a health facility is responsible for ensuring HCW is properly managed. It is important to know and understand everyone's role.

Managers' responsibilities

- Obtain and be familiar with national waste-management policies.
- Develop and implement a facility HCWM plan (goal, budget, personnel, roles, supervision, training, reporting).
- Ensure adequate supply of safety boxes, bins, bin liners, and PPE.
- Designate a responsible person for HCWM.
- Designate a responsible person and ensure proper maintenance of HCWM equipment.
- Identify and budget for HCWM, including final disposal.
- Ensure payment for handling incineration of waste from other facilities.
- Create climate of support for reporting needle-stick injuries.
- Develop protocol for management of needle-stick injury.
- Advocate for health worker safety.
- Ensure all health workers are vaccinated against hepatitis B and other diseases.
- Provide supportive supervision and training for staff on HCWM.

Health care providers' responsibilities

- Follow waste-management policies.
- Follow colour-coded, waste-segregation system.
- Safely dispose of sharps in safety boxes.
- Do not overfill safety boxes.
- Ensure hepatitis B and any other required vaccinations are received.
- Provide OJT for new staff.

Waste handlers' responsibilities

- Know colour-coded waste-segregation system.
- Collect filled safety boxes and used bin liners according to hospital-stipulated frequency for disposal.
- Maintain segregation during handling and transportation.
- Ensure waste is securely stored in a covered area until disposal.
- Use protective equipment when handling HCW.
- Safely transport waste to treatment site according to schedule and route.
- Ensure a clean environment at the facility.
- Ensure hepatitis B and any other required vaccinations are received.
- Ensure one's safety when handling waste and report any incidents or accidents to the supervisor.

Incinerator operators' responsibilities

- Follow incinerator standard operating procedures.
- Use protective equipment when handling waste.
- Monitor and timely report supply of fuel for incinerator.
- Record quantity and type of waste received for incineration.
- Follow regular maintenance schedule for incinerator.
- Ensure treated waste is safely transported to final disposal site.
- Ensure hepatitis B and any other required vaccinations are received.
- Ensure one's safety when operating the equipment and report any incidents or accidents to the supervisor.

Autoclave/shredder/macerator operators' responsibilities

- Operate the equipment in accordance with the standard operating procedures.
- Use protective equipment when handling waste.
- Ensure availability of appropriate supplies.
- Keep records on waste treated.
- Follow regular maintenance schedule and quality-assurance testing procedures.
- Ensure treated waste is safely transported to collection point for final disposal.
- Ensure hepatitis B and any other required vaccinations are received.
- Ensure one's safety when operating the equipment and report any incidents or accidents to the supervisor.

Policies, laws, and regulations on health care waste management

Summary of key laws and regulations on health care waste management

Constitution of Kenya 2010

Provides for the right to a clean and healthy environment.

Environmental Management and Coordination Act 1999

Governs entitlement to a clean and healthy environment

Waste Management Regulations 2006

Segregation of Waste by Generator

Requires every waste generator to segregate waste. This is by separating hazardous waste from non-hazardous waste and disposing of such wastes in such facility as shall be provided by the relevant local authority.

Treatment

Requires any person who generates waste to treat biomedical waste as set out in the law.

Public Health Act - Cap 242:

Makes provision for securing and maintaining health in Kenya by making it an offence to cause nuisance dangerous or injurious to health.

Occupational Safety and Health Act, 2007

This act stipulates the provisions for securing the health, safety, and welfare of persons at work.

Work Injury Benefits Act, 2007

Provides for compensation to employees for work-related injuries and occupational diseases.

Infection Prevention and Control Policy

The purpose of this document is to prevent and manage health care-associated infections by setting national standards for minimizing the hazards that are associated with biological agents for patients, visitors, and staff in health care facilities; and by providing guidance to health care administrators, health care workers, and partners in appropriate infection prevention and control (IPC) programs that are developed to meet these standards.

Infection Prevention and Control Guidelines

These guidelines provide comprehensive and standardized information regarding the prevention and control of transmissible infections.

National Guidelines for Safe Management of Health Care Waste, 2011

This document is a framework for the management of HCW for protection of human and environmental health.

Appendix 1. Hand Washing

Hand Washing

- The purpose of hand washing is to remove soil, blood, other organic material, and transient microorganisms from the skin.
- The three elements that are essential for effective hand washing are soap, clean running water, and friction.
- Hand hygiene is the single most important step to preventing the transmission of pathogens associated with health care services.
- Washing your hands properly takes about 40 to 60 seconds, following the steps in the diagram on the following page.

Figure 7. How to Handwash

How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

 Duration of the entire procedure: 40-60 seconds



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