MODULE 03

Waste Management at Small Healthcare Facilities

The presentation will focus on:

i) Waste management at small healthcare facilities
ii) Areas of waste generation at healthcare facilities
iii) Steps for waste management (segregation, collection and storage, transportation and pre-treatment)
iv) Management of different kinds of waste streams
v) Proper handling of BMW at the facility level
vi) Infection control measures, the dos and don't's of BMWM

This session will orient the participants on bio-medical waste generation areas, steps involved in proper management of bio-medical waste as per the rules and infection control measures to be adopted for effective BMWM. It will further elaborate on the dos and don't's of BMWM for proper waste handling.

3.1 Waste management at small healthcare facilities

The Bio-medical Waste Management Rules, 2016 make it mandatory for all small healthcare facilities to have a sound healthcare waste management system.

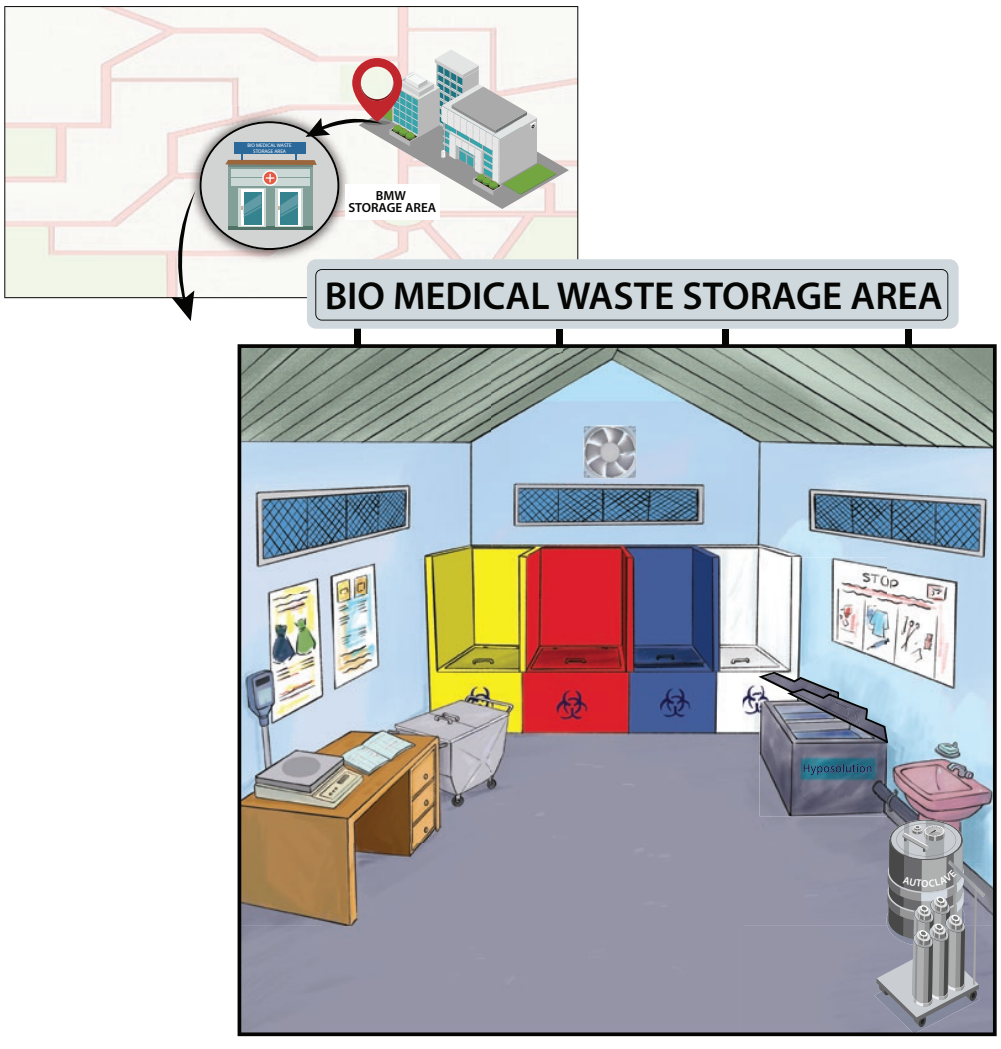
The present module is intended to help the healthcare workers at small healthcare facility levels manage their waste and safeguard themselves and the community from the ill effects of contaminated waste. Small healthcare facilities constitute Primary Health Centres (PHCs) and Community Health Centres (CHCs)

3.1.1 What are PHCs and CHCs?[4]

PHC: PHCs are established under the National Health Mission (NHM) to cover a population of 30,000 in rural areas and 20,000 in hilly, tribal and desert areas. The activities of PHCs involve curative, preventive, promotive and family welfare services.

CHC: Four PHCs are included under each CHC thus catering to a population of approximately 80,000 in tribal/hilly/desert areas and 1,20,000 for plain areas. A CHC is a 30-bedded hospital providing specialist care in medicine, obstetrics and gynecology, surgery, paediatrics and dental. AyUSH. CHC provides facilities for obstetric care and specialist consultations.

Figure 1: Designated place for storing waste at small healthcare facility



4 Rural Health Statistics, 2018-19 prepared by Ministry of Health and Family Welfare, Statistics Division

3.1.2 Areas of waste generation at small healthcare facilities

A healthcare facility generates different kinds and quantities of wastes based on the activities undertaken by it. In general, the common activities of bio-medical waste generation at the small health centres are;

1. Out Patient services and emergencies
2. Routine examination of admitted patients (In Patient services)
3. Child birth
4. Immunisation and curative injections

The following table explains in brief the different areas and types of waste generated in a healthcare facility .

Table 2: Areas of waste generation at PHC[5]

Sr. No.	Areas of waste generation	Activities performed	Type of biomedical waste generated
1	Operation Theatre	Family planning procedures, cataract surgeries. Minor Surgical Procedures	Blood and body fluids, soiled waste, swabs, cotton, syringes and needles, blades, gloves and masks
2	OPD	Out Patient services, emergencies, and routine examination of patients	Syringes and needles, slides and lancets, ampoules, vials, blood and body fluids, broken glasses, plaster cast waste, gloves, swabs and liquid waste
3	Labour room	Child birth and other related activities	Placenta, blood and body fluids, soiled waste, cotton, swabs and liquid waste, syringes and needles, blades, masks and gloves
4	Injection Room	Immunization and curative injections	Syringes and needles, ampoules, vials, broken glasses, gloves and vaccine waste
5	Ward	In-patient services and routine examination of patients	Blood and body fluids, syringe and needle, slides, ampoules, vials, chemical waste, liquid waste, broken thermometer and soiled waste
6	Store	Store	Discarded medicine
7	Laboratory	Malarial smears, TB testing and other essential laboratory services	Blood and body fluids, syringes and needles, gloves, slides, sputum and sputum cups, chemical waste and liquid waste

In addition to the above, at CHC one or two more areas of waste generation is there, such as X-ray facility, blood storage facility and neonatal care depending upon the kind of services provided by the particular CHC.

To manage the waste generated at small healthcare facilities and the outreach sessions, a system of waste management needs to be adapted by small healthcare facilities, which should be safe for the healthcare workers and the community. The waste management operation should be easy to operate and economically viable.

For ease of understanding and implementation, the different steps involved in bio-medical waste management have been depicted in the form of illustrations. These illustrations are self-explanatory and are aimed at helping healthcare workers to manage waste as per the Bio-medical Waste Management, Rules 2016.

For practical purposes, the whole system of bio-medical waste and general waste management in hospitals is divided into the following segments:

5 Guidelines for healthcare workers for waste management and infection control in primary health centres, 2007 prepared by Ministry of Family and Health Welfare

3.1.3 Steps involved in BMW Management

Steps such as (Segregation, Collection & Storage, Transportation and Pre-treatment) is the exclusive responsibility of Health Care Facility. While (Treatment and Disposal) is primarily responsibility of CBWTF operator except for lab and highly infectious waste, which is required to be pre-treated by the HCF.

Figure 2: Steps for BMW management

I) Segregation

A healthcare facility's bio-medical waste must be segregated at the point of generation using the colour coding described in Schedule-I of the BMWM Rules, 2016. To ensure appropriate waste segregation, the following procedures must be followed:

1. Waste must be segregated at the point of generation of source and not in later stages. The location where wastes initially generate, accumulate, and are under the control of a doctor, nursing staff, etc. who is treating the patient and generating bio-medical waste is referred to as the "Point of Generation".
2. Waste storage areas and all wards should have posters or placards encouraging segregation at the source of bio-medical waste.
3. Adequate number of colour coded and well labelled bins as per the amount of waste generation should be kept at all the points of generation.
4. Colour coded plastics bags should be in accordance with the Plastic Waste Management Rules, 2016.
5. Personal protective equipment should be provided to all the healthcare staff and bio medical waste workers for safe handling while segregating waste.
6. Additionally, proper handwashing and hand sanitizing should be practiced after safe segregation to avoid health hazards.

Colour Coding and Type of Container/ Bags to be used for Waste Segregation & Collection

Human/Animal anatomical & soiled waste

मानव/पशु शारीरिक और मटमैला अपशिष्ट

Yellow Bin
पीला डिब्बा

- **Human anatomical waste:**
  A. Tissues, B. Organ, C. Body Parts
- **Animal anatomical waste**
- **Soiled waste: items contaminated with blood and body fluid**
  A. Dressings, B. Plaster casts, C. Cotton swabs, D. Discarded linen, E. Mattresses, F. Beddings, G. Blood bags, H. Discarded and expired medicine

- **मानव शारीरिक अपशिष्ट:**
  A. ऊतक, B. अंग, C. शरीर के अंग
- **पशु शारीरिक अपशिष्ट**
- **मटमैला अपशिष्ट: रक्त और शरीर के तरल पदार्थ से दूषित वस्तुएं**
  A. ड्रेसिंग, B. प्लास्टर कास्ट, C. कॉटन स्वैब, D. फेंके गए लिनेन, E. गद्दे, F. बिस्तर, G. ब्लड बैग, H. छोड़ी गई और एक्सपायर हो चुकी दवा

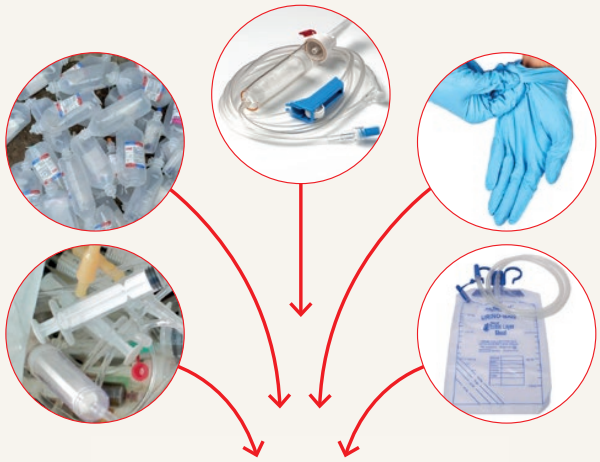
All infected plastic and rubber waste

सभी संक्रमित प्लास्टिक और रबर अपशिष्ट

RED Bin
लाल डिब्बा

- Waste generated from tubings
- Plastic I/V bottles (Normal saline, DNS, RL, etc.)
- IV tubes/BT sets, central line, PICC line
- Gloves
- Urine bags
- Catheters
- Drains
- Syringes without needles

- टयूबिंग से उत्पन्न अपशिष्ट
- प्लास्टिक I/V बोतलें (सामान्य खारा, डीएनएस, आरएल, आदि)
- IV ट्यूब/BT सेट, सेंट्रल लाइन, PICC लाइन
- दस्ताने
- पेशाब की थैलियाँ
- कैथेटर्स
- नालियां
- बिना सुई वाली सीरिंज



All infected sharps waste

सभी संक्रमित नुकीला कचरा

White Container
सफेद कंटेनर

- Waste sharps including metals
- Needles
- Syringes with fixed needles
- Needles from needle tip cutter or burner
- Scalpels
- Blades
- Contaminated sharp objects

- धातुओं सहित अपशिष्ट धारदार वस्तुएँ
- सुइयां
- स्थायी सुइयों के साथ सीरिंज
- सुई टिप कटर या बर्नर से सुई
- स्केलपेल ब्लेड
- ब्लेड
- दूषित धारदार वस्तुएं

Broken & contaminated glassware and Metallic implants

टूटे और दूषित कांच के बने पदार्थ एवं धात्विक प्रत्यारोपण

Blue Bin
नीला डिब्बा

- Infected broken Glass Bottles
- Broken or unbroken glassware and vials
- Ampoules (except cytotoxic waste)

- संक्रमित टूटी कांच की बोतलें
- टूटे या अखंड कांच के बने पदार्थ और शीशियाँ
- इंजेक्शन की शीशी (साइटोटॉक्सिक कचरे को छोड़कर)

II) Collection

A) Time of collection

- As per BMWM Rules, 2016, bio-medical waste should be collected on a daily basis from each ward of the hospital at a fixed interval of time. HCFs should also ensure the disposal of human anatomical waste, animal anatomical waste, soiled waste and biotechnology waste within 48 hours.
- General waste should not be collected at the same time or in the same trolley in which bio-medical waste is collected.
- General waste collection must be done immediately after the visiting hours of the HCFs
- The collection timings must enable the HCF to minimise or nullify the use of interim storage of waste in the departments.
- Adequate PPE kits should be made available to all healthcare workers and waste handlers responsible for managing bio-medical waste.

B) Packaging

- Bio-medical waste bags and sharps containers should be filled to no more than three- quarters full.
- Plastic bags should never be stapled but may be tied or sealed with a plastic tag, or tie.
- Replacement bags or containers should be available at each waste-collection location so that full ones can immediately be replaced.
- Colour-coded waste bags and containers should be printed with the bio-hazard symbol, labelled with details such as date, type of waste, waste quantity, senders name and receivers' details as well as bar-coded label to allow them to be tracked till the final disposal.
- Ensure that bar-coded stickers are pasted on each bag as per the guidelines of the CPCB

C) Labeling

- In accordance with the BMWM Rules, 2016, all the bags/ containers/ bins used for collection and storage of bio-medical waste must be labelled with the symbol of 'Bio Hazard' or 'Cytotoxic Hazard' as per the type of waste in accordance with the BMWM Rules, 2016.
- Bio-medical waste bags/containers are required to be provided with bar code labels in accordance with CPCB guidelines for "Guidelines for barcode System for Effective Management of Biomedical Waste

III) Storage

A) Interim Storage

Waste generated in a healthcare facility has to be shifted to an interim storage point within its premises or offsite to ensure that there is no secondary handling, pilferage of recyclables or inadvertent scattering or spillage by animals. A few things need to be taken care:

- Interim storage of bio-medical waste is discouraged in the wards/different departments of an HCF.
- If waste is needed to be stored on an interim basis in the departments, it must be stored in the dirty utility/sections for not more than 48 hours before handling it to the CBWTF.
- No waste should be stored in patient care areas and procedures areas such as Operation Theatre. All infectious waste should be immediately removed from such areas.
- In the absence of dirty utilities/ sections, such BMW must be stored in a designated place away from patient and visitor traffic or low-traffic area.

B) Central Waste Collection Room for Bio-medical Waste

Each healthcare facility should ensure that there is a designated central waste collection room situated within its premises for storage of bio-medical waste, till the waste is picked and transported for treatment and disposal at CBWTF. This room should be under the responsibility of a designated person and should be under lock & key. The following points may be considered for the construction of the central waste collection room:

- The space allocation for this room must be as per the quantity of waste generated from the hospital.
- The planned space must be sufficient so as to store at least two days' generation of waste.

Central waste collection room must be roofed and manned

- Exhaust fans should be provided in the waste collection room for ventilation.
- It is to be ensured by the healthcare facility that such central storage room is safely inspected for potential fire hazard
- There should also be a provision for water supply adjacent to the central waste storage area for cleaning and washing of this station and the containers. The drainage from the storage and washing area should be routed to the Effluent Treatment Plant.
- Sign boards indicating relevant details such as contact person and telephone number should be provided.
- The entrance of this station must be labelled with "Entry for Authorised Personal Only" and the logo of Bio-medical Waste Hazard.
- It is to be ensured that no general waste is stored in the central waste collection area.
- Healthcare facilities need to maintain a record of waste generated and handed over to the authorised recyclers.
- To ensure protection against pests, it is to be ensured by the HCFs that it has the engagement of pest control agency for taking the pest control measures in the central storage area on regular basis.

IV) Transportation

- In-house transportation of bio-medical waste from the site of waste generation/ interim storage to central waste collection centre within the HCF must be done in closed trolleys/containers preferably fitted with wheels for easy manoeuvrability.
- Patient trolleys must not be used for BMW transportation
- Size of such waste transport trolleys should be as per the volume of waste generated from the HCFs.

Route of intramural transportation of bio-medical waste should be planned in such a way that

- Transportation does not occur through high-risk areas
- Supplies and waste are transported through separate routes
- Waste is not transported through areas having high traffic of patients and visitors
- Central waste collection area can be easily accessed through this route
- Safe transportation of waste is undertaken to avoid spillage and scattering of waste

V) Pre-treatment

Segregated waste from hospitals has to be treated and disposed of according to Schedule I and in compliance with the standards provided in Schedule II of the Biomedical Waste Management Rules, 2016. HCFs will have to send the segregated waste to the common biomedical waste treatment facility after necessary pre-treatment of lab and highly-infectious biomedical waste.

According to the 2016 Rules, no occupier shall establish on-site treatment and disposal facility if a service of common biomedical waste treatment facility is available within a distance of 75 km. Installation of in-house incinerators is not allowed unless there is no common biomedical waste treatment facility nearby.

Pre-treatment: Segregated waste should be pre-treated before being sent for further treatment and disposal at a CBWTF. The pre-treatment procedures are to be selected depending on the composition of the waste (solid or liquid).

Table 3: Categories of waste that need to be treated at the HCF[6]

Sl. No	Category of Waste	Pre-treatment
1	Microbiological waste Biotechnology waste Other clinical laboratory waste	Autoclave Or Non chlorinated disinfectant to achieve $\log_{10}4$ reduction efficiency of microorganisms
2	Discarded linen, mattresses, beddings contaminated with blood or body fluid.2	Non chlorinated chemical disinfection or sterilization and shredding
3	Spill management	Chemical treatment with sodium hypochlorite solution
4	Blood and liquid samples	Chemical disinfection / autoclave / ETP

Making of disinfectant solution: In order to make the disinfectant, 1 per cent hypochlorite solution has to be prepared by mixing sodium hypochlorite in water. Once prepared, this solution remains active for a maximum of six hours[7].

For preparing 1% hypochlorite solution from the available sodium hypochlorite solution in the market following formula can be used, V1 X C1 = V2 X C2

where, V1 = Volume of available sodium hypochlorite solution

C1 = Strength of available sodium hypochlorite solution (in percentage)

V2 = Volume of water to be used as disinfecting solution

C2 = Strength of disinfecting solution (i.e. 1%)

In case sodium hypochlorite solution is not available and the disinfectant has to be prepared by bleaching powder. For preparing 1% Chlorine solution, we need to mix 10 gm of Chlorine with 1 litre of water and assuming the Bleaching Powder as containing 30% available chlorine, 10 gm of chlorine can be available in 3.3 X 10 = 33 gm of Bleaching Powder.[8] This 33 gm of bleaching powder when added to 1 litre of water gives a 1% chlorine solution which can be used as disinfectant.

Liquid waste: Liquid waste has to be collected through a separate channel leading to the effluent treatment system.

Mutilation: Once segregated and disinfected, plastic waste needs to be mutilated to avoid any illegal reuse. Mutilation can be done by:

- Use of shredder machines in the case of a bigger multi-speciality hospital
- Use of simple scissors to create punctures in the infected solid plastic waste in smaller units where funding big machines can be difficult.

Incineration: Important considerations for Captive Incinerators

1. The existing incinerators shall comply with the above revised emission norms within a period of two years from the date of notification.
2. The existing captive incinerators shall comply with the standards for Dioxins and Furans of 0.1ngTEQ/Nm3, within two years from the date of commencement of these rules
3. Wastes to be incinerated shall not be chemically treated with any chlorinated disinfectants.
4. Ash from incineration of biomedical waste shall be disposed of at common hazardous waste treatment and disposal facility. However, it can also be disposed of in municipal landfill, if the toxic metals in incineration ash are within the regulatory quantities as defined under the Hazardous Waste (Management and Handling and Transboundary Movement) Rules, 2008 as amended from time to time.

6 Training manual on bio-medical waste management for doctors, nurses, nodal officers and waste managers, 2018

7 Training manual on bio-medical waste, 2016 prepared by Centre for Science and Environment

8 SWACHHTA Guidelines for Public Health Facilities, Ministry of Health & Family Welfare, Government of India, 2015

5. Only low Sulphur fuel like Light Diesel Oil or Low Sulphur Heavy Stock or Diesel, Compressed Natural Gas, Liquefied Natural Gas or Liquefied Petroleum Gas shall be used as fuel in the incinerator.
6. Shall monitor the stack gaseous emissions (during optimum operational capacity of the incinerator) once in three months through a laboratory approved under the Environment (Protection) Act, 1986 and record of such analysis results shall be maintained and submitted to the prescribed authority. In case of dioxins and furans, monitoring should be done once in a year.
7. Shall install continuous emission monitoring system for parameters as stipulated by the SPCB or PCCs in authorisation and transmit the real time data
8. Incinerators (combustion chambers) shall be operated with such temperature, retention time and turbulence, as to achieve Total Organic Carbon content in the slag and bottom ashes less than 3% or their loss on ignition shall be less than 5% of the dry weight.
9. Shall use combustion gas analyser to measure CO2, CO and O2 periodically so as to operate incinerator at suitable conditions to achieve desired combustion efficiency.

Deep burial: In rural areas and in remote areas where there is no accessibility to common biomedical waste treatment facility, deep burial is allowed for human anatomical waste and animal waste. However, there are certain precautionary measures to be kept in mind in the construction of such pits.

Note - The deep burial facility shall be located and constructer as per the provisions and guidelines issued by Central Pollution Control Board from time to time.

Table 4: Treatment and disposal options for different waste categories suggested in BMWM, rule 2016

Category	Treatment and Disposal Options
Yellow	Incineration or Plasma Pyrolysis or deep burial*
	Incineration or Plasma Pyrolysis or deep burial* In absence of above facilities, autoclaving or micro-waving/ hydroclaving followed by shredding or mutilation or combination of sterilization and shredding.
	Expired cytotoxic drugs and items contaminated with cytotoxic drugs • To be returned to the manufacturer or supplier for incineration at temperature >12000C OR • To CBWTF or HWTSDF for incineration at >12000C Or Encapsulation Or Plasma Pyrolysis at >12000C **All other discarded medicines shall** • Be either sent back to manufacturer OR • Disposed by incineration
	Incineration or Plasma Pyrolysis or Encapsulation in HWTSDF
	After resource recovery, the chemical liquid waste • Shall be pre-treated before mixing with other waste water. • The combined discharge shall conform to the discharge norms given in Schedule II. • Non-chlorinated chemical disinfection followed by incineration or Plasma Pyrolysis or for energy recovery. • In the absence of above facilities, shredding or mutilation or combination of sterilisation and shredding. • Pre-treat to sterilise with non-chlorinated chemicals on-site as per NACO or WHO guidelines • Autoclaving / microwaving / Hydroclaving And thereafter for incineration

Table 4 continued

Category	Treatment and Disposal Options
Red	Autoclaving/ micro- waving/ hydroclaving followed by shredding or mutilation or combination of sterilisation and shredding. Treated waste to be sent to registered or authorised recyclers or for energy recovery or plastics to diesel or fuel oil or for road making, whichever is possible PLASTIC WASTE SHOULD NOT BE SENT TO LANDFILL SITE
White translucent	Autoclaving followed by Shredding or mutilation or encapsulation in metal container or cement concrete
Blue	Disinfection (by soaking the washed glass waste after cleaning with detergent and Sodium hypochlorite treatment) or through autoclaving or microwaving or hydroclaving and then sent for recycling

**Disposal by deep burial is permitted only in rural or remote areas where there is no access to CBWTF within 75 Km. this will be carried out with prior approval from the prescribed authority and as per the Standards specified in Schedule-III. The deep burial facility shall be located as per the provisions and guidelines issued by Central Pollution Control Board from time to time.*

i) Segregation

Do's

1. Always segregate waste into infectious and non-infectious waste at source of generation in the healthcare facility or during outreach sessions
2. Segregate infectious waste into:
   a. Sharps like needles, blades, lancets in puncture proof and leak proof white coloured container
   b. Non-Sharps (soiled waste) like syringes, gloves, mask, these are to be disposed in red plastic bins/bags
   c. Broken glass, empty viols, slides, metallic body parts in puncture proof and leak proof containers with blue colour marking
   d. Anatomical waste like placenta in yellow plastic bins/bags
3. Non-infectious (General) waste like waste similar to household waste including packaging material, cartons, fruit and vegetable peels, syringe and needle wrappers, medicine covers in green/blue plastic bins or bags as per SWM rules

Don'ts

1. Never mix infectious and non-infectious waste at source of generation, during waste collection, waste storage, waste transportation or during final disposal of waste

Figure 3: Good and bad practices of segregation (Source segregation should be adopted)

Bad - Mixing of waste

Good - **Store waste in secure containers/bags**

ii) Collection and Storage

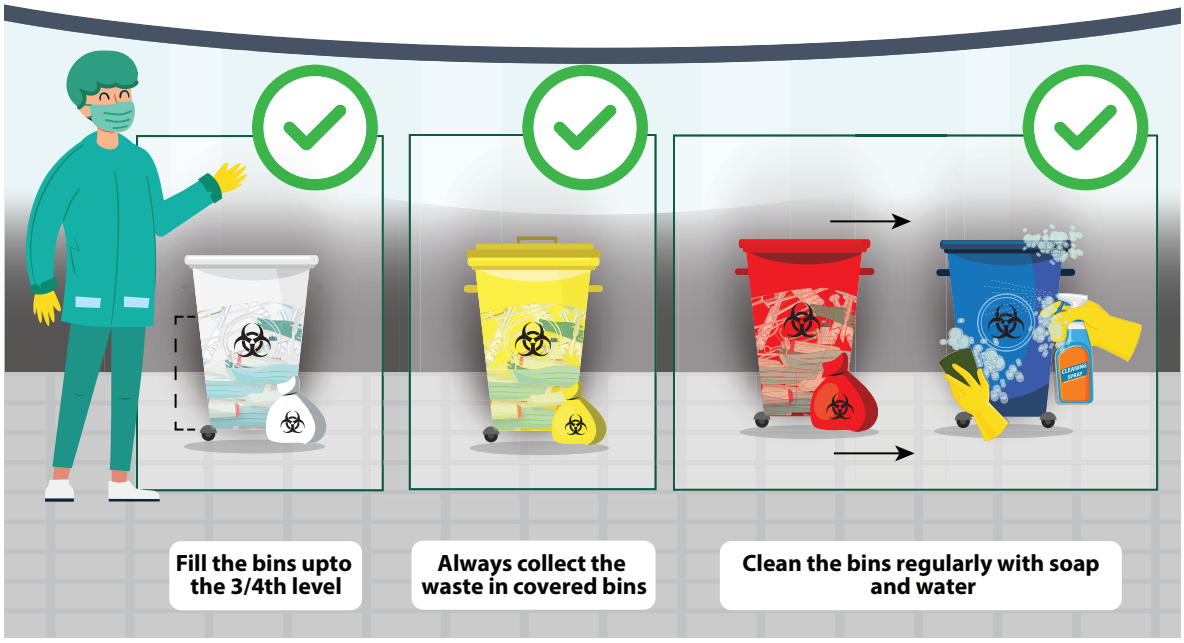
Do's

1. Always collect the waste in covered bins
2. Fill the bins up to the three-fourth level
3. Clean the bins regularly with soap and water

Don'ts

1. Never overfill the bins
2. Never mix infectious and non-infectious waste in the same bin
3. Never store waste beyond 48 hrs

Figure 4: Good and bad examples of waste collection and storage



iii) Transportation

Do's

1. Always carry/transport the waste in closed containers from the source of generation to final disposal.
2. Use dedicated waste collection bins for transporting waste

Don'ts

1. Never transport the waste in open containers or bags, it may spill and cause spread of infections
2. Never transport waste with sterile equipment

Figure 5: Good and bad examples of waste movement in the HCFs

Bad - Don't carry waste in open/punctured bags which may cause spillage, and never carry it through crowded areas

Good - Always carry the waste in secure sealed containers

iv) Treatment and Disposal

Do's

1. Always remember to disinfect and mutilate the waste before its final disposal
2. Remember the following while treating the waste streams
   a. Anatomical waste to be handed over to CBWTF for incineration. If the facility is not linked with CBWTF, then this category of waste needs to be deep buried at the HCF
   b. Needles to be cut (with hub cutters) and disposed to the sharps container (white container) at the HCF and handed over to the CBWTF for final disposal. If the facility is not linked with the CBWTF, the needles should be disposed in a sharp pit located at the centre
   c. Waste generated from disposable items such as tubing, bottles, urine bags, syringes (without needles and fixed needle syringes), etc should be disposed of in red container, the red bins needs to be handed over to the CBTWF. If the facility is not linked with CBWTF, the syringes along with other infected plastics to be chemically disinfected or autoclaved, shredded and given to authorised recyclers for resource recovery
   d. Broken glass and vials to be collected separately in a cardboard box with blue coloured marking, and handed over to the CBTWF. If the facility is not linked with CBWTF, the waste needs to be chemically disinfected or autoclaved or microwaving or hydroclaving and given to authorised recyclers for recycling

Don'ts

1. Never throw infectious waste into general waste
2. Municipal waste to be collected separately in dry and wet bin and handed over to the agency collecting municipal waste from the facility/area

3.2 Management of Different Waste Streams

3.2.1 Needles and Syringes

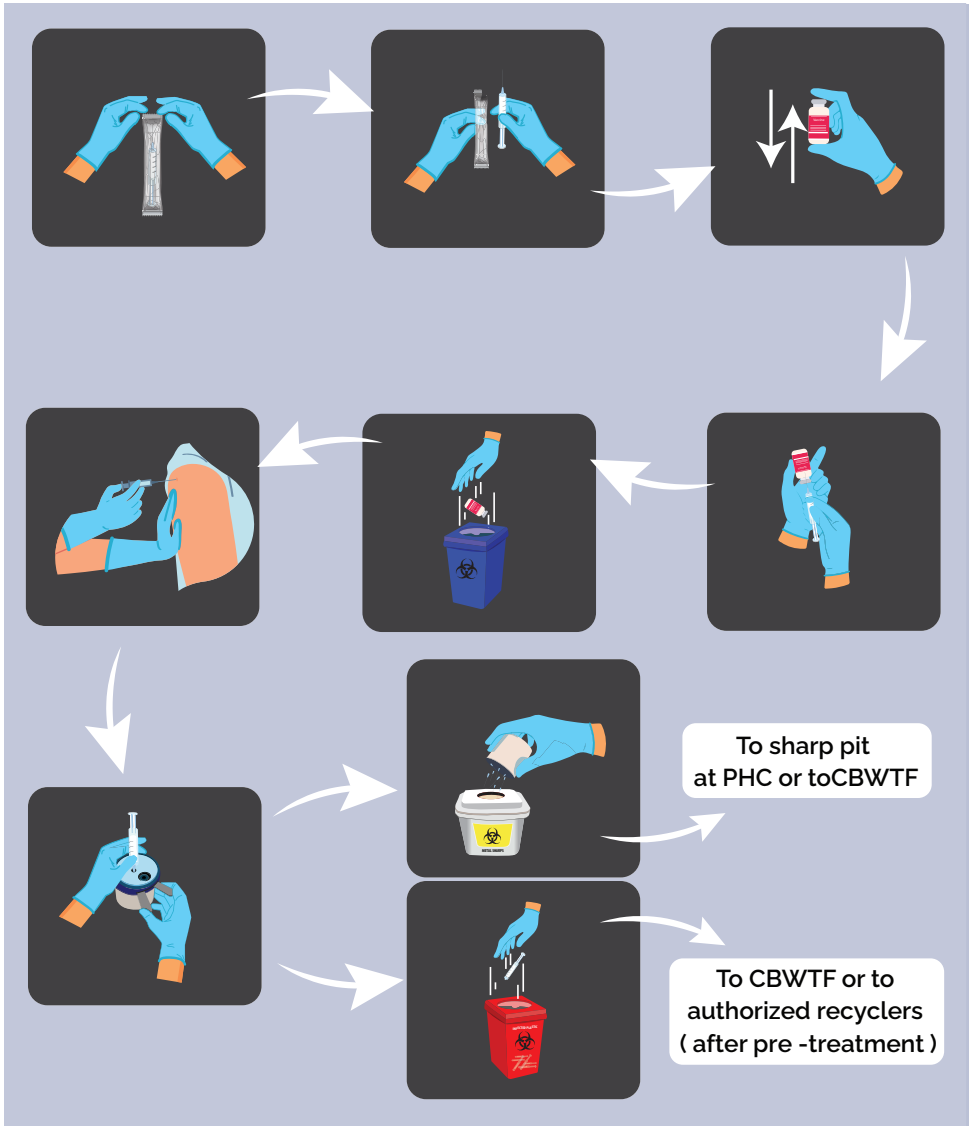
The waste management of needles and syringes for an outreach session;

Figure 6: Collection and storage of needles and syringes in the HCFs

Collect sharps in puncture proof containers in the outreach session

Carry the sharps from the outreach session in a puncture proof container to the sub centre/ PHC for disinfection and mutilation

Figure 7: Disposal of used needles and syringes in the HCFs



Do's

1. Always wear protective gears like gloves while handling needles and syringes
2. Always collect the needles and syringes in puncture proof containers
3. Disinfect the mutilated needles and the syringes with 1% bleaching powder solution for at least an hour
4. Collect the mutilated and disinfected needles in puncture proof containers for final disposal in sharps pit

Don'ts

1. Never mix sharps with other waste streams
2. Never discard the sharps in non-puncture proof containers like polybags
3. Never recap or bend the syringes
4. Never burn the syringes
5. Never dispose the syringes in open areas

3.2.2 Metal Sharps

Do's

1 Discard the metal sharps like blades, lancets and scalpels in puncture proof containers

2 Disinfect the metal sharps with disinfectant solution before final disposal

Don'ts

1. Never discard the metal sharps in non-puncture proof containers

Figure 8: Bad examples of disposing metal sharps

3.2.3 Anatomical Waste

Do's

1. Always segregate infectious waste and anatomical parts like placenta from other waste streams at the source of generation
2. Collect placenta in closed bags/covered bins at the source of generation
3. Carry the placenta in covered bins/bags to final disposal site
4. Dispose the placenta along with disinfectant in secure deep burial pit or send it to CBWTF for incineration

Don'ts

1. Never mix the waste at source of generation or later during collection and transportation
2. Never dispose the anatomical waste in unsecure open areas or in water bodies

Figure 9: Process of disposing anatomical waste at healthcare facility

3.2.4 Plastic Waste

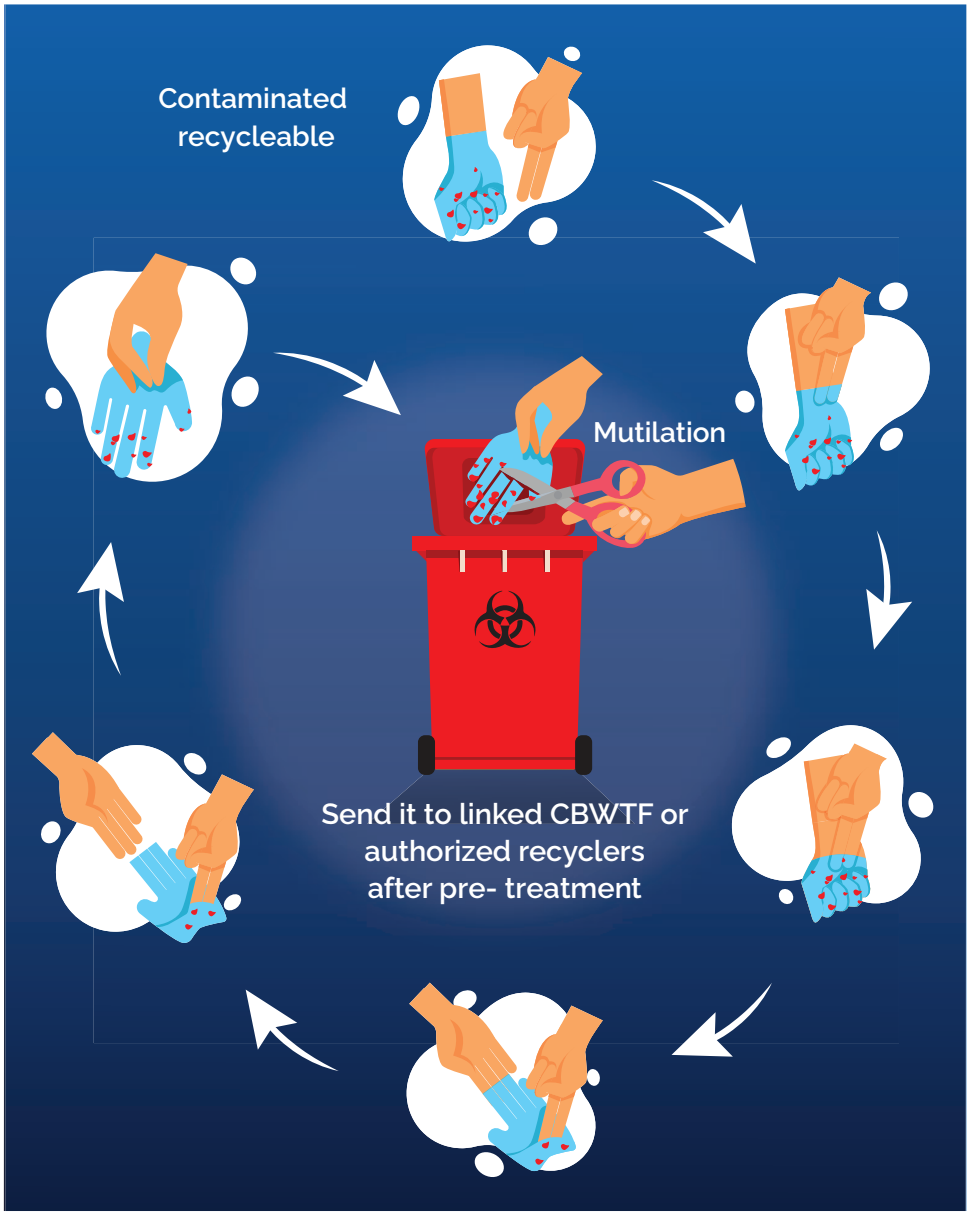
Do's

1. Always cut/puncture the plastic waste such as intra-venous tubes, bottles, syringes, latex gloves and mask by scissors before disinfection
2. Disinfect the plastics in covered containers with 1% bleaching powder solution at least for one hour

Don'ts

1. Never dispose the used plastics with general waste stream
2. Never reuse the disposable gloves and masks
3. Never leave the mask unattended/available to unauthorised people

Figure 10: Process of disposing contaminated recyclables at the healthcare facility



3.2.5 Liquid waste spills

Liquid waste is any blood, body fluid, pus, any discharge from wounds or liquid chemicals.

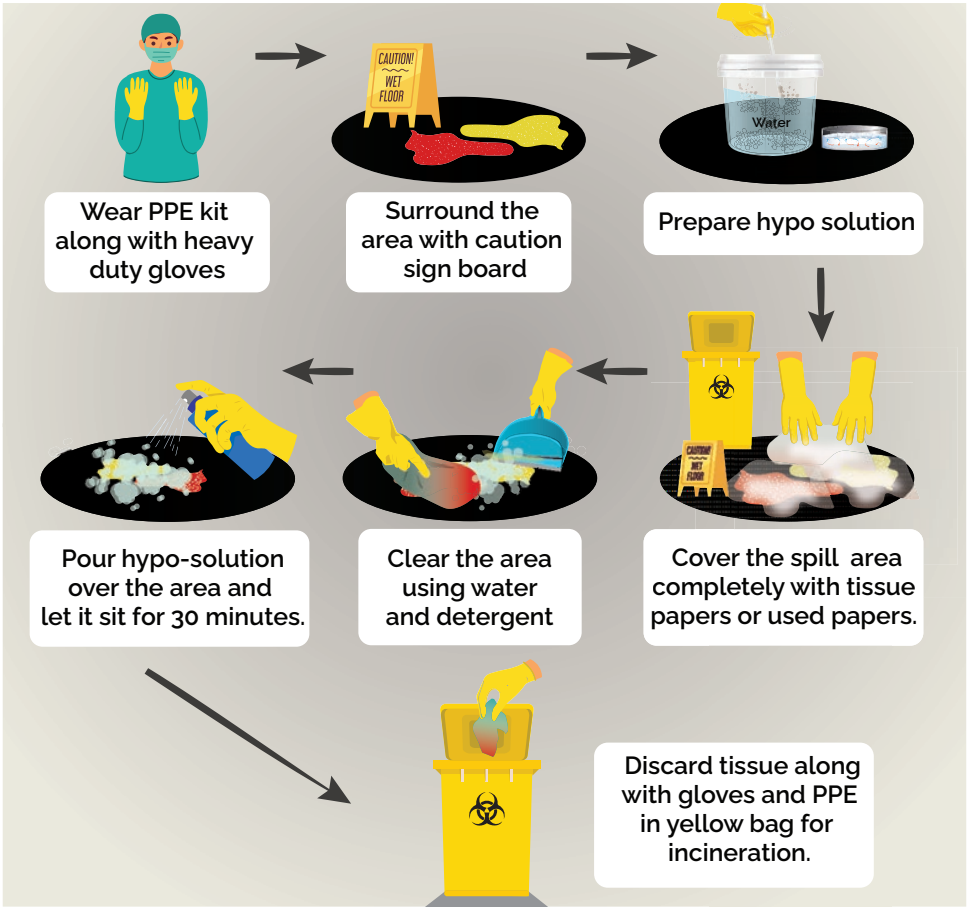
Do's

1. Determine the nature of spill
2. Evacuate all the people not involved in cleaning up, if the spillage involves a particularly hazardous substance
3. Use a pair of non-sterile gloves, tongs and brush to sweep up
4. Use disposable absorbent paper towels to absorb as much of the fluids as possible
5. Wipe the area with water and detergent until it is visibly clean.
6. Saturate the area again with sodium hypochlorite 0.5% (10 000 ppm available chlorine). This is a 1:10 dilution of 5.25%[9] sodium hypochlorite bleach, which should be prepared daily.
7. Chemical treatment using at least 10% Sodium Hypochlorite having 30% residual chlorine for twenty minutes or any other equivalent chemical reagent that should demonstrate $Log_{10}4$ reduction efficiency for microorganisms as given in Schedule- III. – CPCB Rules

Don'ts

1. Never clean liquid waste spills without adding disinfectant to the spills[10]
2. Never reuse the cloth used for cleaning the spills for any other purpose without proper disinfection. Infection control

Figure 11: Process of managing liquid waste spills at HCFs



9 WHO Guidelines on Drawing Blood: Best Practices in Phlebotomy, 2010 World Health Organization

10 Guidelines for healthcare workers for waste management and infection control in primary health centres, 2007 prepared by Ministry of Family and Health Welfare

3.3 Infection Control

3.3.1 Precautions to be adopted

a. Always wear personal protective gears while handling waste

b. Wearing head gears, eye covers(glasses), mask, apron , gloves and boots these constitute the barrier for transmission of infections

c. Taking immunisation against Hepatitis B and Tetanus are important universal precautions

The healthcare workers should be trained on proper use of personal protective equipment regarding:

a. When to use

b. Type of PPE to be used

c. How to use properly

d. The limitations of the equipment

e. Proper care, maintenance, useful life and disposal of the PPE

Figure 12: Type of PPEs used in HCF

Table 5: When to use different PPE[11]

Procedure	Glove	Gown	Mask	Goggles
Taking BP	-	-	-	-
Temperature, pulse,	-	-	-	-
Counting respiration	-	-	-	-
IM injection	✓	-	-	-
Starting IV line or taking blood or IV injection	✓	-	-	-
Controlling minor bleeding	✓	-	-	-
Cleaning an incontinent patient with diarrhoea	✓	-	✓	-
Handling soiled laundry	✓	✓	✓	✓
Cleaning contaminated instruments*	✓	✓	✓	✓
Controlling massive bleeding	✓	✓	✓	✓
Irrigating a wound	✓	✓	✓	✓
Conducting Delivery	✓	✓	✓	✓
Intubation	✓	✓	✓	✓
Suctioning	✓	✓	✓	✓
Liquid spill management	✓	✓	✓	✓
Mercury spill management	✓	✓	✓	✓
Handling waste (support staff)	✓	✓	✓	✓

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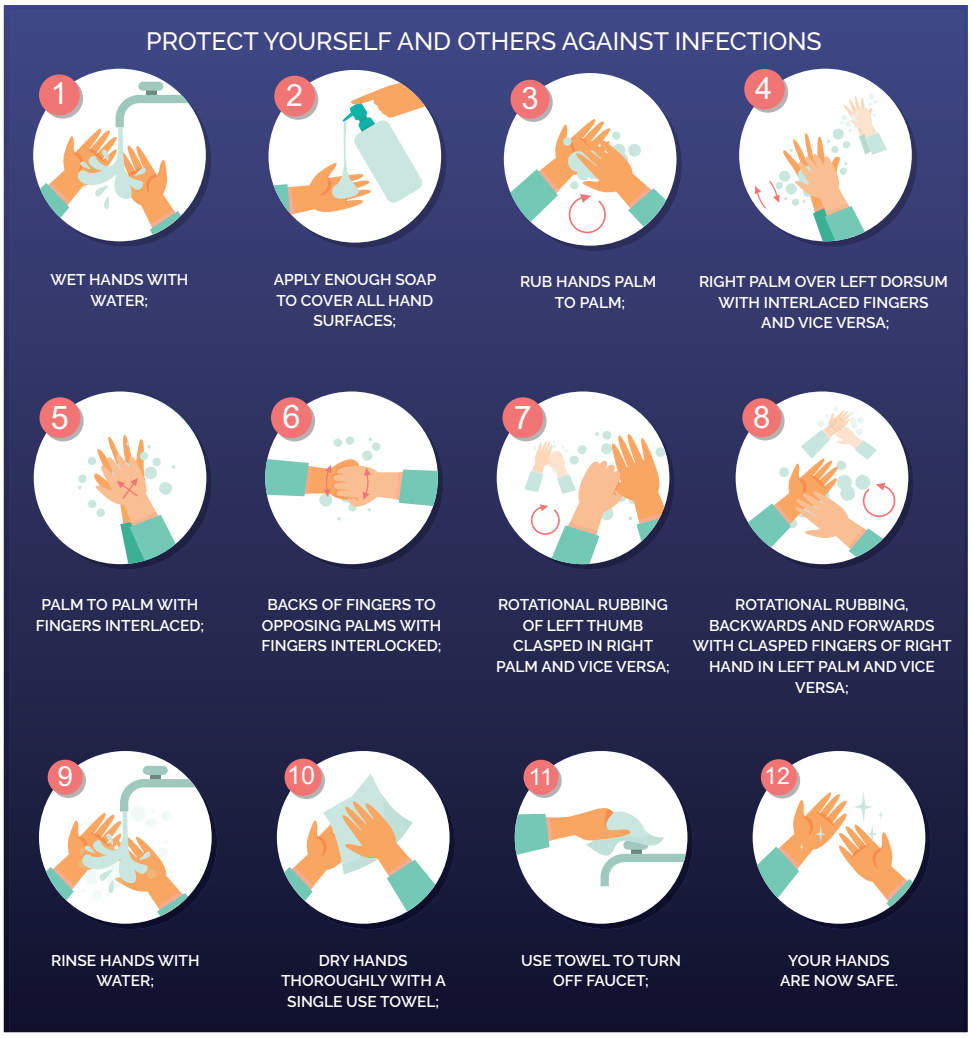
3.3.2 Hand washing

a. Hand washing is one of the most important infection control precaution to be followed by all healthcare workers.

b. Always wash your hands before and after any procedure, examining two patients, handling waste, eating and drinking, collecting lab samples and handling blood and body fluids.

c. Routine hand washing can be done by using soap and water.

Figure 13: Process of proper hand-washing to keep infection away[12]



3.3.3 Use of Disinfectants

a. Store bleaching powder in dry, dark and cool places

b. The bleaching powder container should always be kept closed

c. While preparing 1% chlorine solution from bleaching powder add 33 grams of bleaching powder in 1 litre water, as explained above

d. Stir the solution well

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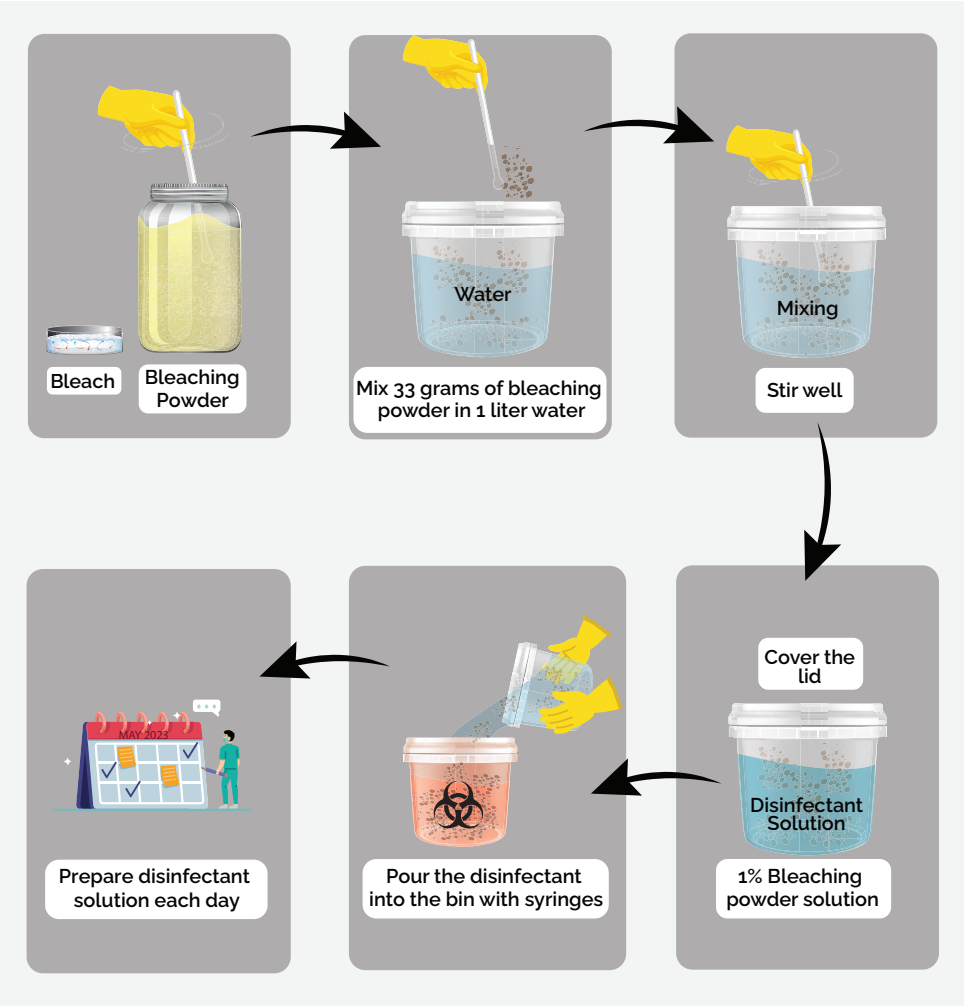
e. After the solution is ready, pour the solution in the waste bin meant for disinfection of used plastics and sharps

f. Always remember to prepare new bleaching powder solution every day. Only use freshly prepared bleaching powder solution each day and keep it covered with. Minimal agitation of the prepared liquid

Figure 14: Process of preparing disinfectant solution at the HCFs



3.3.4 Cleaning of floors

a. Wear personal protective gears like gloves and apron while cleaning the floors

b. Clean the floors regularly

c. Use hot water and soap for routine cleaning of the floors

d. Add disinfectants to water for cleaning labour room

e. Mop/ cloth needs to be disinfected after every use

Figure 15: Proper cleaning of floor with disinfectant should be done in areas with high risk of infection regularly