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Environmental health management
for voluntary medical male circumcision services

Site management guide

Published in 2016

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Published in 2016

For more information, contact pfscm@pfscm.org.

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Acronyms

AIDS	Acquired immune deficiency syndrome
APC	Air pollution control
HCW	Health care waste
HCWM	Health care waste management
HIV	Human immunodeficiency virus
HLD	High-level disinfection
IPC	Infection prevention and control
MC	Male circumcision
NGO	Non-governmental organization
PPE	Personal protective equipment
VMMC	Voluntary medical male circumcision

Terms and definitions

Alcohol hand rub: Surgical hand preparation with a waterless, chemical-based hand rub.

Anaerobic digestion: A biological process making it possible to degrade organic matter by producing biogas which is a renewable energy source and a sludge used as fertilizer.

Arm's length: Distance approximately equal to the length of the human arm (60 cm).

Autoclave: A device designed to sterilize equipment/materials by using steam under pressure within a chamber.

Autoclaving: The method of sterilizing equipment, such as surgical or laboratory equipment, using an autoclave.

Chemical disinfection: The application of a liquid chemical agent to eliminate the majority of pathogenic microorganisms, with the exception of bacterial spores, on inanimate objects or surfaces.

Chlorine solution: Disinfectants widely used for decontaminating surgical instruments and laboratory equipment and for spot-disinfection of countertops and floors in health care facilities (e.g., sodium hypochlorite and calcium hypochlorite).

Collection: The act of removing accumulated waste from the point of generation for the purpose of delivering it to its next destination along the way to final disposal.

Composting: A biological process making it possible to degrade organic matter by producing biogas which is a renewable energy source and a sludge used as fertilizer.

Controlled dump: A planned land disposal site that incorporates covering waste with sand, soil, or any other convenient materials. This site doesn't allow for burning of waste; is access controlled; has basic record-keeping; and has measures in place for waste picking/scavengers.

Decontamination: To neutralize or remove dangerous substances, radioactivity, or infectious agents from an area, surface, object, or person.

Disinfection: A process by which viable biohazardous agents are reduced to a level unlikely to produce disease in healthy people, plants, or animals.

Disposal: The process of getting rid of or removing something especially by systematic destruction.

Encapsulation: Immobilizing pharmaceuticals in a solid block within a plastic or steel drum.

Engineered landfill: A waste facility in which an engineered method of disposing of solid waste is applied on land in a manner that protects the environment. This is done by spreading the waste in thin layers, compacting it to the smallest practical volume, and covering it with soil by the end of each working day, constructing barriers to collect infiltration, and evacuate the gases produced.

General/non-hazardous waste: Waste that does not pose any particular biological, chemical, radioactive, or physical hazard.

Hand hygiene: A general term referring to hand cleansing.

Hand scrub: Surgical hand preparation with antimicrobial soap and water.

Hazard: A danger or risk that has the potential to cause harm.

Hazardous waste: Waste that may have a significant adverse effect on public health and/or the environment by circumstances of use, quantity, concentration, or inherent physical, biological, chemical, or toxicological characteristics.

Health care waste: All waste generated by health care facilities, including hazardous waste and general waste. Waste that is generated during health care delivery (e.g., during treatment, diagnostics, immunization, or operation) and from patients and visitors.

High-level disinfection: The process of killing all microorganisms with the exception of high numbers of bacterial spores.

High-temperature incineration: The burning of waste at temperatures greater than 1100 degrees C.

Inertization: Rendering a substance chemically inactive.

Infection prevention and control: Placing a physical, mechanical, or chemical barrier between the host and microorganisms to help prevent the spread of these microorganisms from client to client, staff to client, and client to staff.

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 in isolation wards and equipment (e.g., swabs, bandages, and disposable medical devices).

Kilopascal (kPa): The Standard International (SI) unit measuring pressure. It is the SI-derived unit of pressure, internal pressure, stress, Young's modulus, and ultimate tensile strength (kilopascal = 1,000 pascals).

Landfill: A waste facility used for the purpose of disposing of general waste by burial.

Liquid soap: Detergent that contains very low concentrations of antimicrobial agents, effective solely as preservatives.

Low-level disinfection: A process able to kill some bacteria, viruses, and fungi but not relied on to kill resistant microorganisms (e.g., mycobacterium tuberculosis or bacterial spores). It should be used only to decontaminate the environment (e.g., surfaces, floors, furniture, and walls). It must not be used for processing instruments and other items.

Low-temperature incineration: The burning of waste at temperatures less than 1100 degrees C.

Occupational health and safety: Techniques designed to eliminate or significantly reduce the risk of infection and injury.

On-site transportation: Procedures and processes for transferring health care waste from the point of generation to a storage location or from the storage location to a treatment or disposal site within the health facility.

Packaging: Often used interchangeably with the word "containerization." Refers to wrapping and safely containing relevant waste streams to prevent exposure during transport (e.g., rigid plastic containers, flexible plastic bags, or lined fiberboard box sets).

Parts per million (ppm): Used to define the concentration of something in water or soil. One ppm is equivalent to 1 milligram of something per liter of water (mg/l) or 1 milligram of something per kilogram of soil (mg/kg).

Pathological waste: Human tissues, organs or fluids, body parts, and contaminated animal carcasses.

Personal protective equipment (PPE): Specialized clothing or equipment worn by employees for protection against hazards (e.g., head protection, goggles/glasses, masks, aprons, gloves, and footwear). This clothing must be taken off and disinfected or disposed of when work with waste is completed.

Physical barrier: Any equipment, facility, or device that is designed to achieve containment or exclusion.

Re-use: To use articles from the waste stream again for a similar or different purpose without changing the form or properties of the articles.

Segregation: Systematic separation of different wastes into designated categories at the point of generation for subsequent containment, transportation, treatment, and disposal.

Sharps injury: Injury with any sharp object—such as needles, prickers, blades, or broken glass—that may have the potential to transmit infectious agents, in particular blood-borne viruses.

Sharps pit/concrete vault: A formed or excavated hole or cavity in the ground to dispose of sharps.

Sharps safety box: A box designed for disposing of needles with syringes and other sharps.

Sharps waste: Waste that poses a potential risk of injury and infection due to its puncture or cutting properties (e.g., needles, blades, or broken glass). For this reason, sharps are considered

one of the most hazardous categories of waste generated during medical activities and must be managed with the utmost care.

Shelf life: When referring to sterilized medical devices, it is the period of time during which the item is considered safe for use.

Steam sterilization: The process that uses saturated steam under pressure—for a specified exposure time and at a specified temperature—as the sterilizing agent.

Sterilization: A validated physical or chemical process that completely destroys or removes all microbial life, including bacterial spores. It is usually achieved by using devices that sterilize through steam under pressure (autoclaves), dry heat, ethylene oxide (ETO) and other gases, or liquid chemicals for prolonged soaking times. Items that are sterilized are considered sterile until such time that the packaging is torn, wet, or damaged. Sterility is a function of intact packaging.

Sterile processing area(s): Area(s) of a health care facility in which decontaminated, clean instruments and other medical and surgical supplies are inspected, assembled into sets and trays, and wrapped, packaged, or placed into rigid sterilization container systems for subsequent sterilization.

Treatment: Any method, technique, or process designed to change the physical, biological, or chemical character or composition of waste. Also includes any method used to remove, separate, concentrate, or recover hazardous, toxic, or infectious components of waste to reduce the toxicity or infectiousness of the waste and minimize the impact on the environment.

Waste: Unwanted materials.

Waste identification: The process of visually recognizing relevant health care waste streams at the point of generation.

Waste minimization: The application of activities such as waste avoidance, reduction, re-use, and recycling to minimize the amount of waste requiring disposal.

Water bath: A bucket 3/4 full of cold/room-temperature water. (This definition is specific to this document.)

How to use the site management guide

Introduction

The practices described in this site management guide are based on World Health Organization (WHO) guidelines and further interpretation. The guide is intended for use in all types of health care facilities providing medical procedures, including voluntary medical male circumcision.

Health care waste management (HCWM) and basic infection prevention and control (IPC) in health care facilities have four primary objectives:

- Prevent health care-related infections
- Prevent occupational health and safety injuries
- Protect the community from infectious diseases
- Prevent environmental contamination

How to use the site management guide

The materials in this site management guide are divided into four topic areas:

1) Occupational health and safety
2) Health care waste management
3) Infection prevention and control
4) VMMC single-use instruments

The user is strongly advised to read the guide in the order in which the topics are presented to ensure proper management of environmental hygiene best practices.

Users of the guide

The expected users of this guide include:

- Health service providers, health facility staff, and trainers from government, faith-based, private, and NGO health facilities and institutions
- Individuals, groups, and organizations engaging in health care provision
- Policymakers, health managers, program officers, and health administrators

Occupational health and safety

Hand hygiene

Personal protective equipment

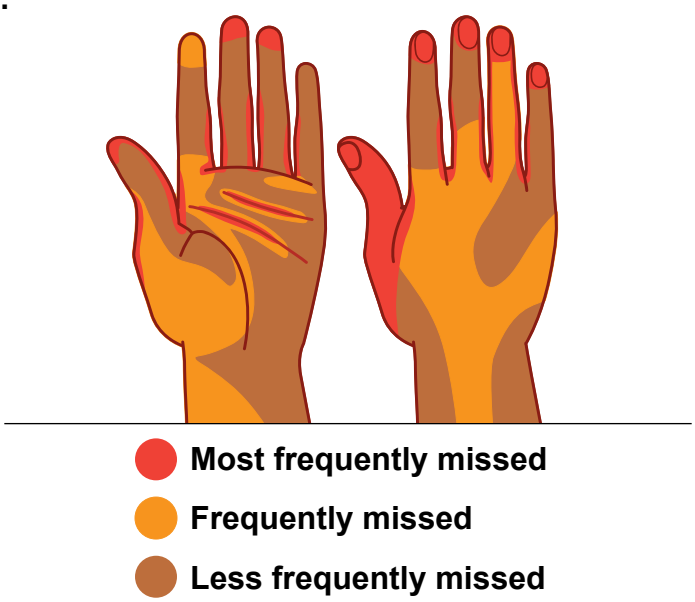
Injection safety and sharps safety

Hand hygiene

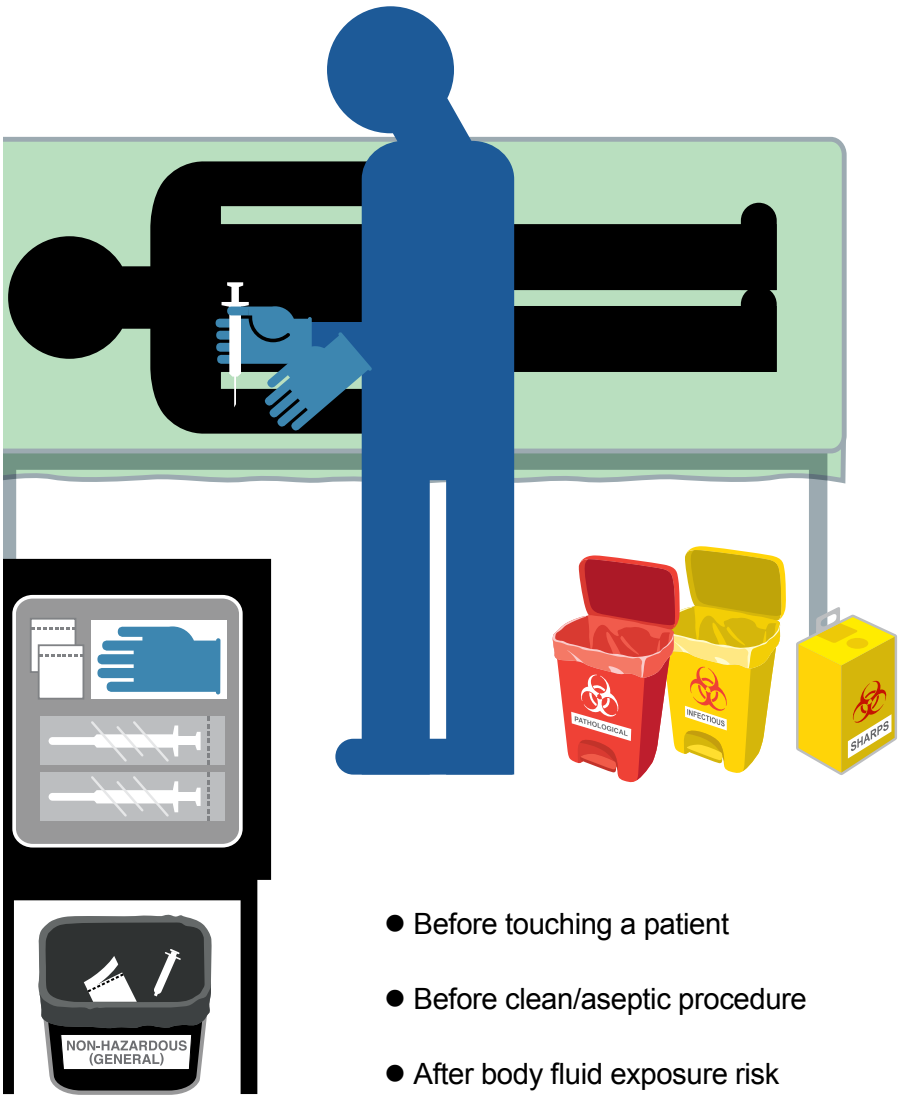
Hand washing should be done:

- Before and after eating, after using the toilet, and when soiled.
- Immediately on arrival to and before leaving work.
- Before and after each patient contact.
- After gloves are removed.
- Before putting on gloves for performing clinical and invasive procedures.
- Before preparing, handling, serving, or eating food, and before feeding a patient.
- Before preparing medication.
- Whenever there is a chance of contamination.

When washing your hands, be careful not to miss these areas:



When? Your 5 moments for hand hygiene

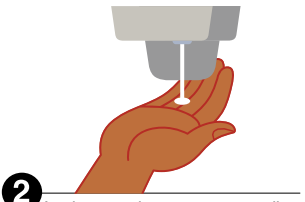


- Before touching a patient
- Before clean/aseptic procedure
- After body fluid exposure risk
- After touching a patient
- After touching patient surroundings

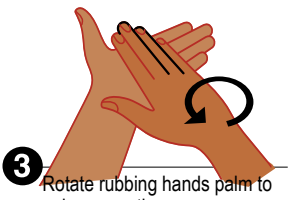
Hand washing with liquid soap and clean water

Washing should last 40-60 seconds.

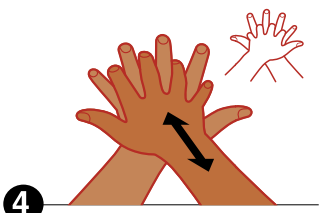
1. Wet hands with clean water.



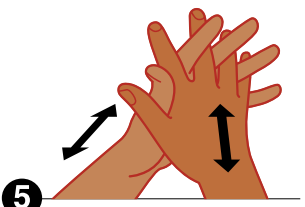
2. Apply enough soap to cover all hand surfaces.



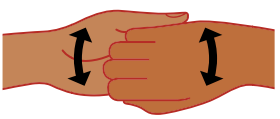
3. Rotate rubbing hands palm to palm seven times.



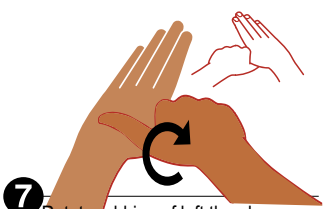
4. Rub right palm over left dorsum with interlaced fingers and vice versa seven times.



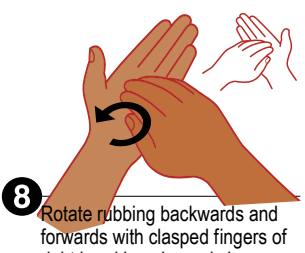
5. Rub palm to palm with fingers interlaced seven times.



6. Rub back of fingers to opposing palms with fingers and vice versa seven times.



7. Rotate rubbing of left thumb clasped in palm and vice versa seven times.

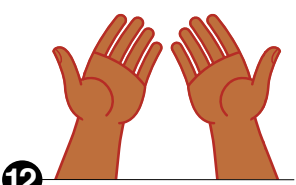


8. Rotate rubbing backwards and forwards with clasped fingers of right hand in palm and vice versa seven times.

9. Rinse hands with clean water; keep water running.

10. Dry hands thoroughly with single-use towel.

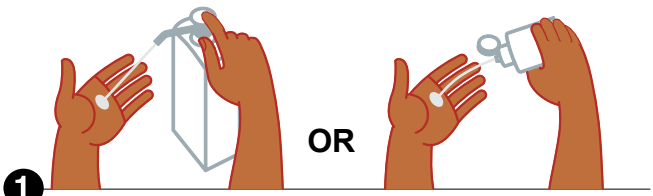
11. Use towel to turn off faucet and open door, then discard towel into a waste receptacle.



12. Your hands are now clean.

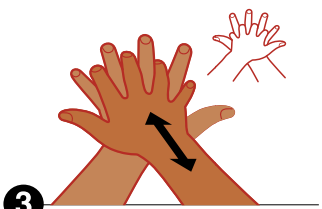
How to use alcohol hand rub*

Washing should last 20-30 seconds.

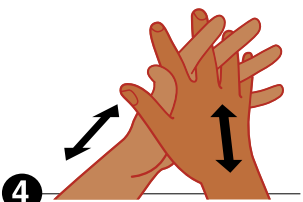


1. Apply a palmful of the product in a cupped hand, covering all surfaces.

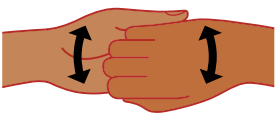
2. Rub hands palm to palm.



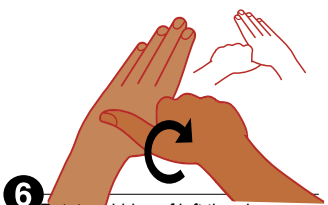
3. Rub right palm over left dorsum with interlaced fingers and vice versa.



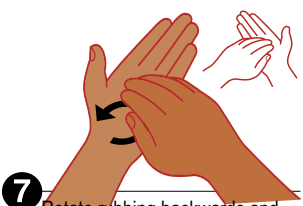
4. Rub palm to palm with fingers interlaced.



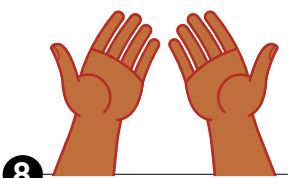
5. Rub back of fingers to opposing palms with fingers interlocked.



6. Rotate rubbing of left thumb clasped in palm and vice versa.



7. Rotate rubbing backwards and forwards with clasped fingers of right hand in palm and vice versa.

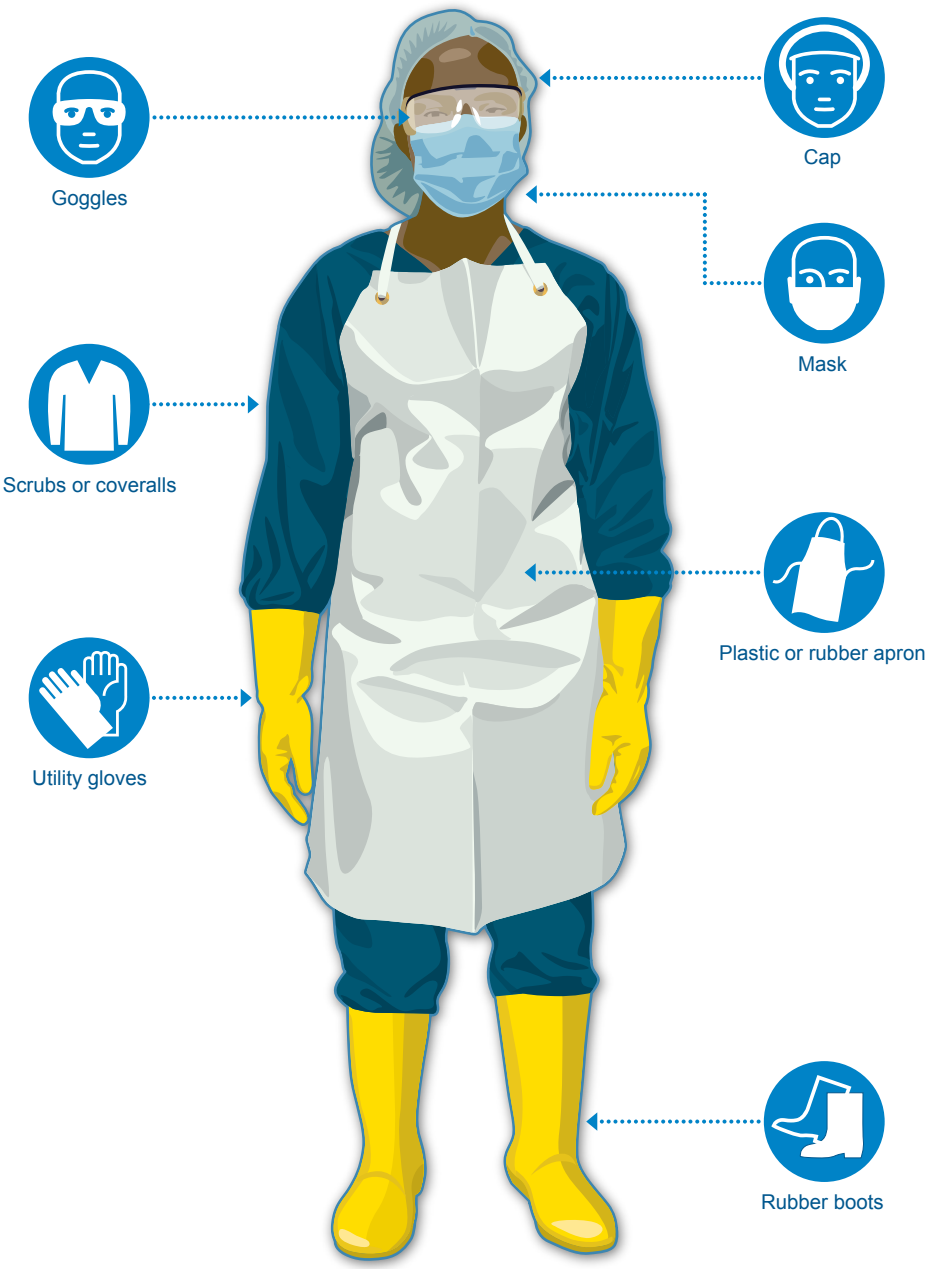


8. Once dry, your hands are now clean.

**Alcohol rub should only be used on visibly clean and dry hands to remove contaminants that cannot be seen.*

Personal protective equipment

PPE for waste handlers

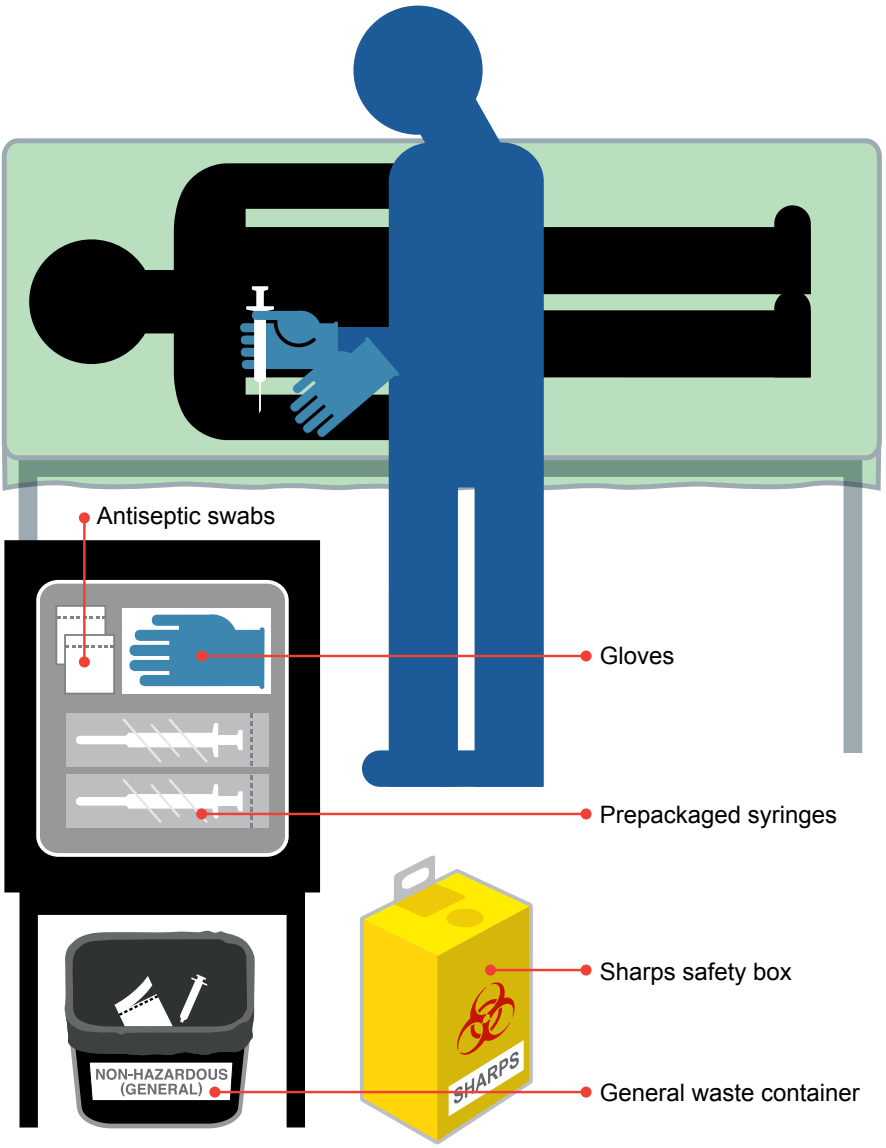


PPE for incinerator operators

Injection safety and sharps safety

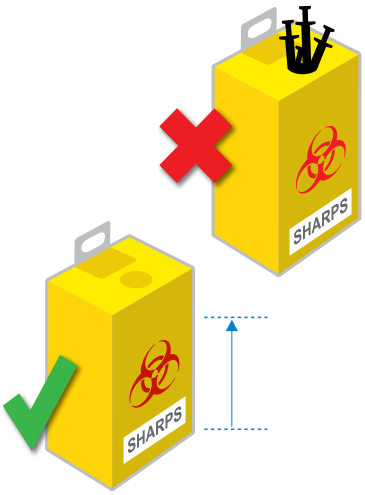
Injection safety

Health service provider should have arm's length, unobstructed access to all equipment. There should be no obstructions between patient and health service provider.

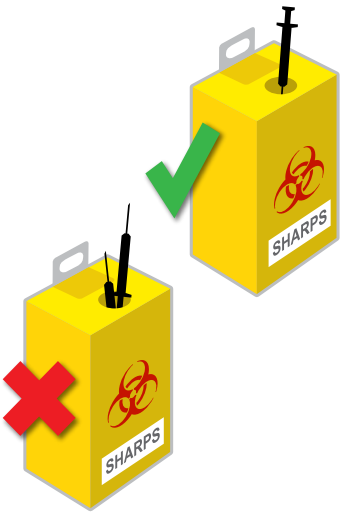


Sharps safety

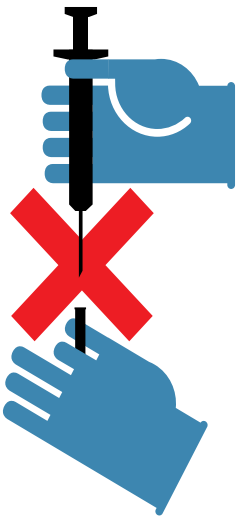
Place sharps in yellow sharps safety box.



Seal off securely when 3/4 full.



Deposit syringe with needle down.



Do not recap.

Health care waste management

Waste categorization and packaging

Collection of waste

Waste storage area recommendations

On-site transporting best practices

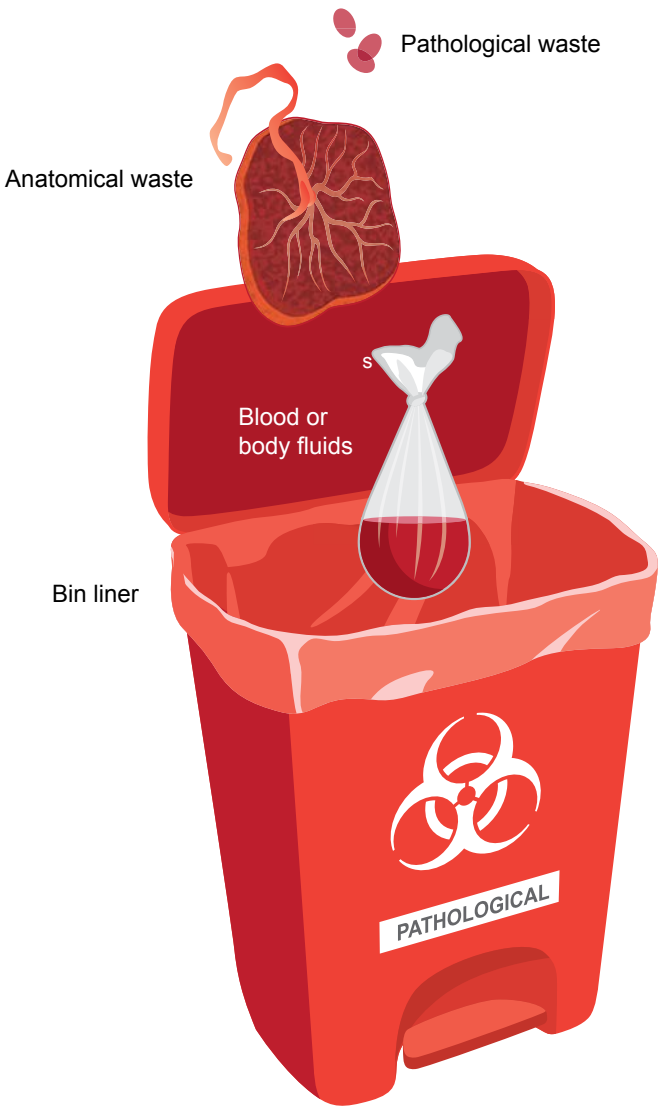
Spill management

Treatment of waste

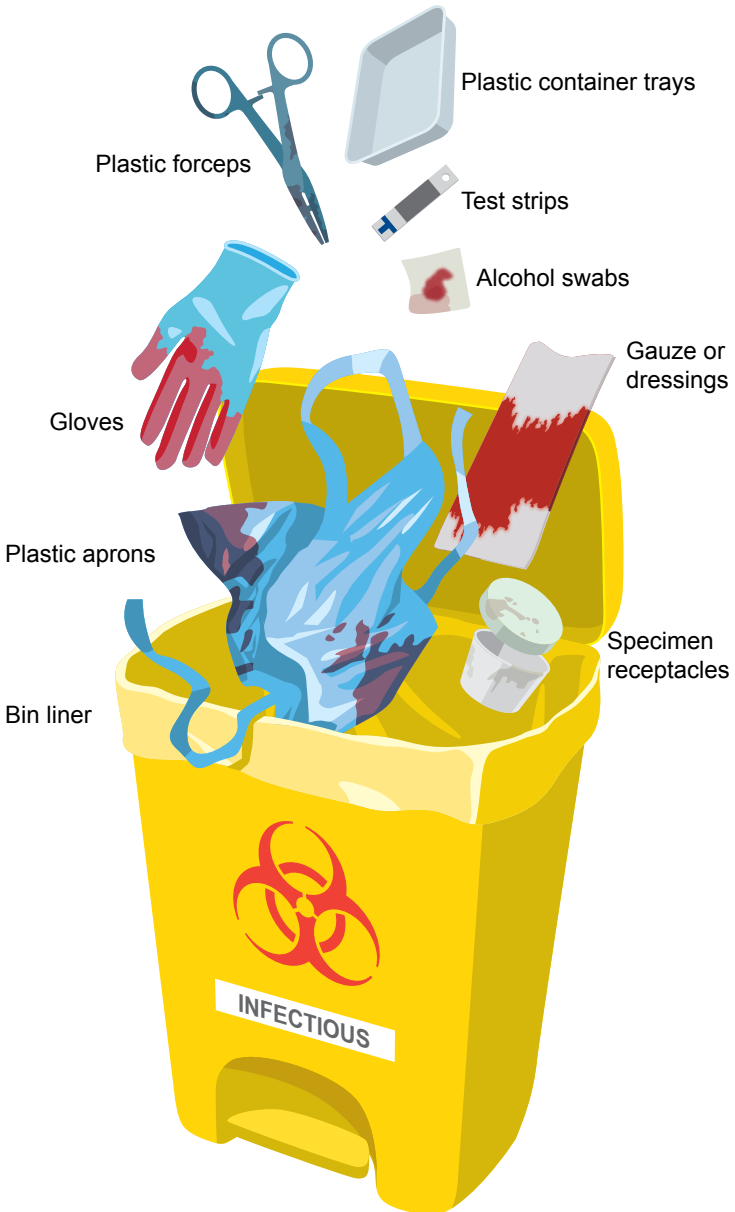
Waste categorization and packaging

Identification and color coding

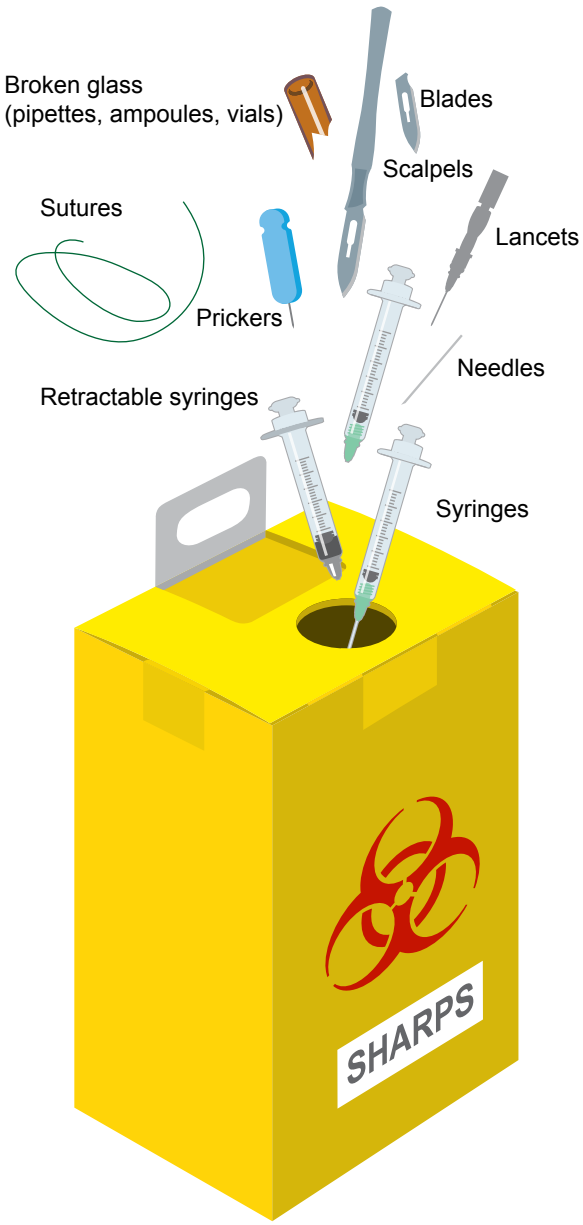
Pathological



Infectious


Plastic container trays
Plastic forceps
Test strips
Alcohol swabs
Gauze or dressings
Gloves
Plastic aprons
Specimen receptacles
Bin liner
INFECTIOUS

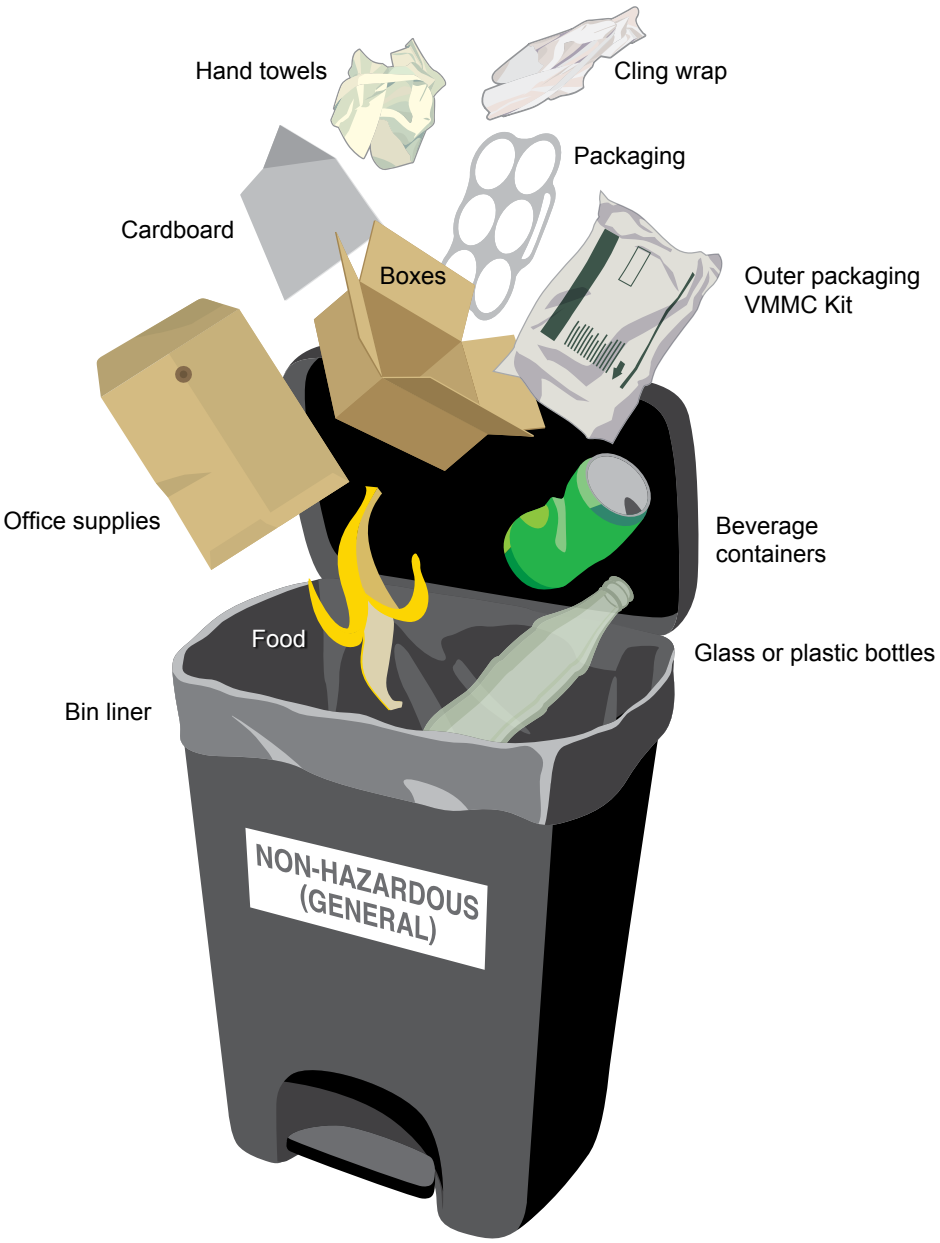
Sharps


Broken glass
(pipettes, ampoules, vials)
Blades
Scalpels
Sutures
Lancets
Prickers
Needles
Retractable syringes
Syringes
SHARPS

Chemical

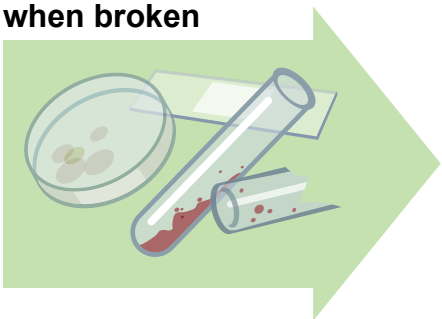
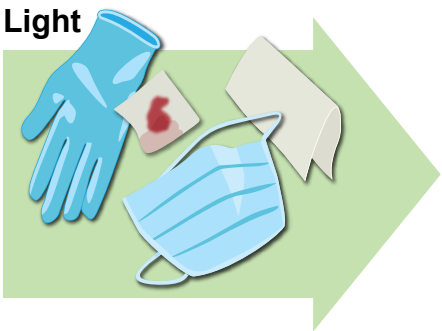

Unusable pharmaceuticals
Expired pharmaceuticals
Unusable chemical
Damaged pharmaceuticals
Bin liner
CHEMICAL WASTE
TOXIC
CHEMICAL WASTE
TOXIC

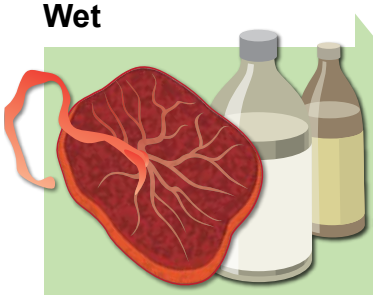
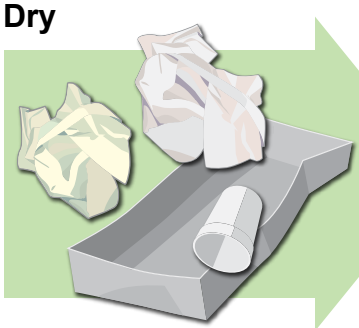
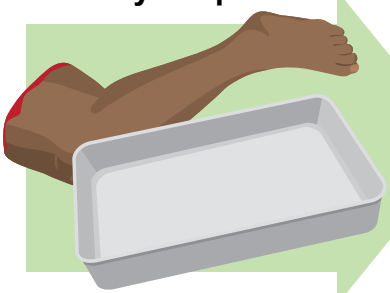
Non-hazardous (General)



Packaging considerations

Sometimes specific waste streams don't fit into conventionally available hazardous waste packaging. In this instance, the figure below can help health care facility staff in making educated packaging decisions.

Waste is:	Packaging considerations:
Potentially sharp when broken 	 Use a puncture-proof, sealable, rigid plastic container. If volumes are too high to warrant the use of sharps containers, then improvise by double bagging and using lined box sets so that the contents are protected from breakage during transit.
Heavy 	 Use smaller containers (in volume or capacity) that can withstand relative load. Smaller containers are easier to lift and carry.
Light 	 Use larger volume containers or bags.

Waste is:	Packaging considerations:
Wet 	 Use containers/packaging that are leak-proof and liquid-proof (e.g., a cardboard box would not be suitable).
Dry 	 Use lightweight packaging or bags as there is no risk of leakage or seepage.
Clumsy, large, or oddly shaped 	 Use the right-sized container for the waste stream. If the waste doesn't fit, improvise where necessary ensuring the container can be closed/sealed properly taking into account the nature of the waste and prescribed color-coding and labeling requirements.

Labeling

Labeling of waste containers and bags is used to identify the source, record the type and quantities of waste produced in each area, and allow problems with waste segregation to be traced back to source.

1 Label containers/bags with proper hazard symbol and type of waste if applicable (pathological, infectious, etc.).

Using an international hazard symbol on each waste container and bag is recommended. See Annex 1 for all hazardous waste symbols.

Use the caution symbol for non-reusable metal instruments.

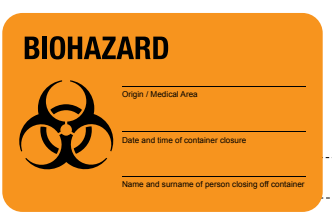
Use biohazard symbol for pathological and infectious waste. A symbol is not required for general waste.

Use biohazard symbol for sharps waste.

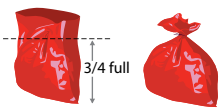
Use the toxic symbol for chemical waste.

2 During collection, place stickers on containers/ bags with waste details.

A simple approach is to attach a label to each filled container/bag with the details of the medical area, date, and time of closure of the container, and the name of the person filling out the label.



Waste segregation

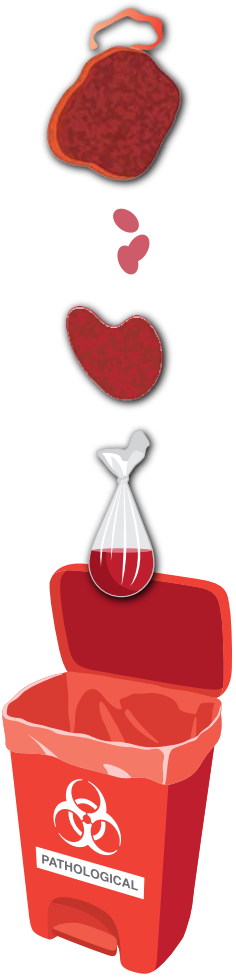


Bin liner should be sealed with a cable-tie when no more than 3/4 full.

Containers filled with hazardous items should be appropriately labeled.

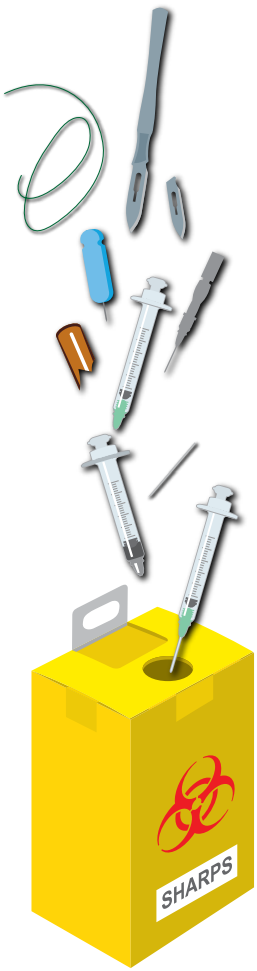
Disposal should follow thereafter according to the recommended disposal procedure for each category.

Pathological



Infectious

Sharps



Chemical

Non-hazardous
(General)

Outer packaging VMMC Kit

Collection of waste

Do not allow waste to accumulate at the point of generation.

Collect waste daily or as frequently as possible.

Do not remove bags from the segregation point unless they are labeled and properly sealed.

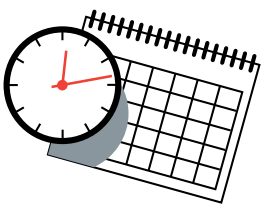
Replace the bags or containers immediately with new ones of the same type.

Keep a readily available supply of fresh collection bags or containers at all locations where waste is produced.

Waste storage area recommendations

The area must:

1. Be enclosed, convenient, easy to use, accessible, and of low public visibility
2. Be well ventilated
3. Be well lit
4. Have an impermeable, slip-resistant, hard-standing floor
5. Have access to a water source with good drainage for cleaning
6. Be equipped with a fire extinguisher
7. Be kept clean
8. Have a lockable door
9. Be labeled with recommended signage:



Total storage time until treatment and disposal

- Pathological: 24 hours
- Infectious: 48 hours
- Sharps: 30 days
- Chemical: 12 months and/or close of program
- Non-hazardous (General): 48 hours

WASTE STORAGE AREA RECOMMENDATIONS

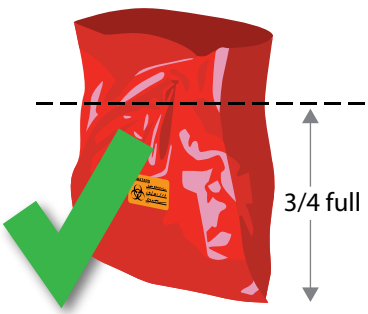
On-site transporting best practices

Handling hazardous health care waste

Look before you touch

Properly sealed, with no needles protruding

Overfilled and/or not properly closed



Sealed off securely when no more than 3/4 full

Showing leakage or spill

Correctly sealed

Torn or broken

Lifting and carrying bags

Right
Ensure that the bag has been closed and labeled correctly and is no more than 3/4 full to maintain a stub for carrying.

Do not lift
If you see a bag that has leaks, breaks, tears, or penetrating sharps, refer to the spill management section for how to safely clean up the spill.

Grab the bag by the stub and carry far away from the body only if safe to do so and while wearing the correct PPE.

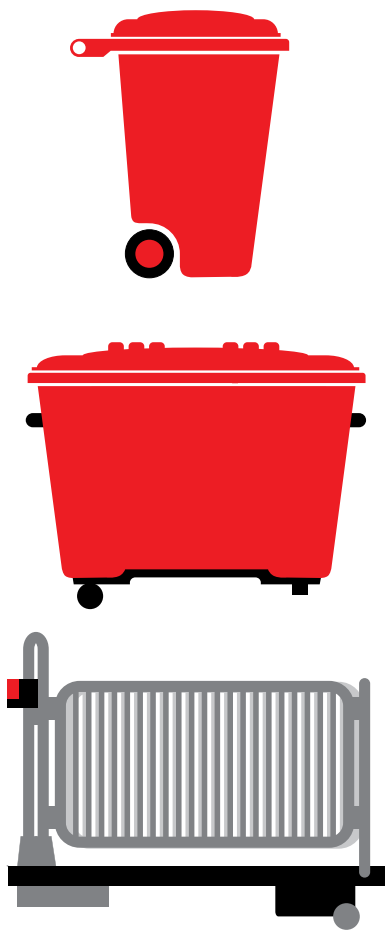
Carrying sharps safety boxes

Equipment used for hazardous health care waste transport

Hazardous waste may be transported from source location to the site's temporary storage location by hand or with wheelbarrows, trolleys, wheelie-bins, or other wheeled containers or carts that are not used for any other purpose.

Equipment should:

- Be easy to load and unload.
- Be free of sharp edges that could damage, perforate, or tear bin liners during loading and unloading.
- Be easy to clean and disinfect as needed (proper records should be kept of these activities).
- Have side walls or barriers to safely enclose the waste containers during transport to prevent toppling, breakage, and spillage.



Spill management

Responding to a spill:

1. Remain calm.
2. Evacuate all unnecessary personnel and quarantine the spill area.
3. Assess the nature of the spill (see the following pages).
4. Contact management and/or emergency services.
5. Put on necessary PPE.
6. Follow protocol for your type of spill.
7. Work efficiently and carefully.
8. Be aware of the surroundings at all times.
9. Once the emergency has been identified, contact the appropriate departments.

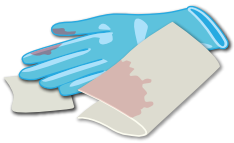
SEEK IMMEDIATE MEDICAL ATTENTION IF EXPOSED TO HAZARDOUS SUBSTANCES

- Only staff trained in spill management can conduct these procedures.
- Personal protective equipment (PPE) must be used as part of infection prevention and control.

- Cap
- Goggles
- Mask
- Plastic **or** rubber apron
- Utility gloves
- Rubber boots

Infectious waste

Dry spill



1 Collect dry spill with brushes, pans, or suitable equipment.

2 Place collected dry spill into a yellow bag.

3 Decontaminate spill area by carefully spraying with a chlorine solution and wiping the area dry with cloths or paper towels. Repeat until all contaminants are visibly removed and the area is dry.

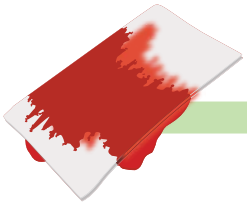
4 Place used cloths or paper towels into a yellow bag, close securely, and label.

5 Take yellow bags to designated waste storage area.

6 Dispose of or decontaminate all PPE or equipment used.

Pathological waste

Wet spill



1. Place cloth or paper towels or suitable absorbent on wet spill to absorb it (approximately 5 minutes).

2. Carefully collect saturated cloth or paper towels or absorbent material and place into a red bag.

3. Continue to carefully wipe the area with the cloth or paper towels until all visible contaminants are removed.

4. Place used cloth or paper towels into red bag.

5. Decontaminate spill area by carefully spraying with a chlorine solution and wiping the area dry with a cloth or paper towel. Repeat until all contaminants are visibly removed and the area is dry.

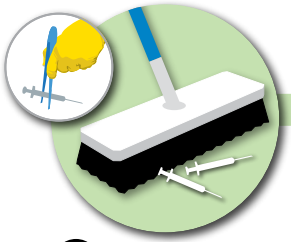
6. Place used cloth or paper towels into the red bag, close securely, and label correctly.

7. Take red bags to designated waste storage area.

8. Dispose of or decontaminate all PPE or equipment used.

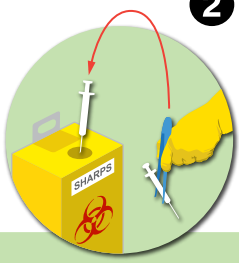
Infectious waste (sharps)

Sharps spill



1 Collect the sharps with a brush and long-handled dust pan or other suitable equipment. Never pick up sharps with hands. Use forceps or tweezers where necessary.

2 Place collected sharps into a sharps safety box and close securely.



3 Decontaminate spill area by carefully spraying with a chlorine solution and wiping the area dry with cloth or paper towels. Repeat until all contaminants are visibly removed and the area is dry.

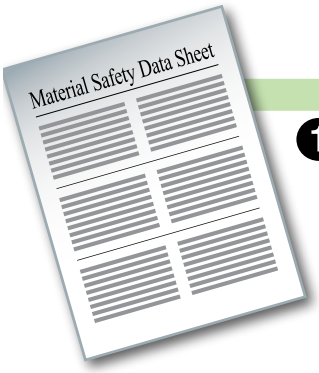
4 Place used cloth or paper towels into a yellow bag, close securely, and label correctly.

5 Take the sharps safety box(es) and yellow bag to designated waste storage area.

6 Dispose of or decontaminate all PPE or equipment used.

Chemical

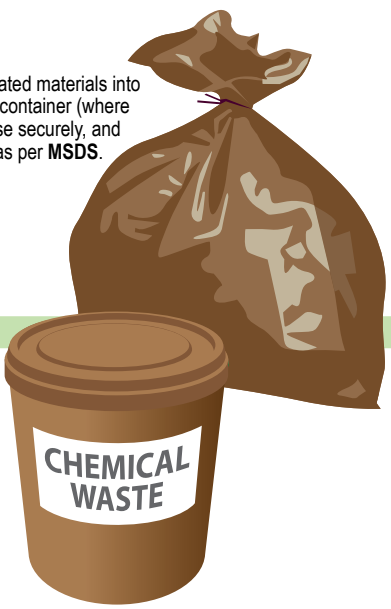
General spill



1. Consult the **material safety data sheet (MSDS)** issued with the chemical in question for guidance.

2. Collect chemical spill with suitable means and equipment as directed by the **MSDS**.

3. Place contaminated materials into a brown bag or container (where applicable), close securely, and label correctly, as per **MSDS**.



4. Once spill is cleared, decontaminate spill area as per **MSDS**.

5. Take brown bag or container to designated waste storage area.

Heavy metal

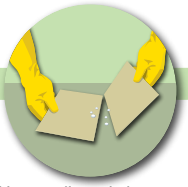
Mercury spill

1. Retrieve the mercury spill kit.

2. Place any broken glass into a heavy-duty self-sealing plastic bag. Clearly label the bag as containing mercury contaminant.

3. Collect all visible drops of mercury using one of the following:
   a. Aspirator with a narrow tube
   b. Syringe (without a needle)
   c. Pasteur pipette or rubber bulb
   d. Strips of adhesive tape

4. Place collected mercury in jar with enough clean water to cover the mercury, close the lid securely, and label correctly.



5. Use cardboard sheets or masking tape to capture any spilled beads, using your torch for optimal visibility.

6. Place disposable gloves and all cleaning aids used in the cleanup process into a self-sealing bag and label accordingly.

7. Make arrangements with responsible person with regards to storage and/ or disposal procedures for mercury waste.

8. Wash protective visors with liquid soap and warm clean water, and dry with paper towel before returning to Mercury Spill Kit.

9. Wash hands thoroughly with soap and warm clean water.

10. Document details in the logbook or control sheet found in the mercury spill kit.

11. Return the mercury spill kit to the proper person. Replace any used items in the spill kit.

Treatment of waste

Treatment technology	Pathological	Infectious
High temperature incineration with APC	✓	✓
Low temperature incineration	✓	✓
Chemical disinfection		✓
Steam sterilization	✓	✓
Microwave radiation	✓	✓
Pit or bury		
Encapsulation/ inertization		
Composting (aerobic, vermiculture)		
Anaerobic digestion (fermentation)		
Engineered landfill		

Sharps	Chemical (Including pharmaceutical)	Non-hazardous (General)
✓	✓	✓
✓		✓
✓		
✓		
✓		
✓		✓
	✓	
		✓*
		✓*
		✓

**Only to be used for the treatment of non-hazardous/general food waste.*

Disposal of treated waste

Treatment technology	Engineered landfill	Open pit
High temperature incineration with APC	✓	
Low temperature incineration	✓	
Chemical disinfection	✓	
Steam sterilization	✓	
Microwave radiation	✓	
Encapsulation/ inertization	✓	
Composting (aerobic, vermiculture)		✓
Anaerobic digestion (fermentation)		✓

Sharps pit/ concrete vault	Encapsulation/ inertization
✓	✓
✓	✓
✓	
✓	

Infection prevention and control

Treating water for cleaning

Housekeeping

Processing reusable metal instruments

Treating water for cleaning

When there is no access to clean water or if the supply has been made unsafe because of untreated surface water (from floods, streams, or lakes), boil the water to treat it. Cloudy water should be filtered before boiling.

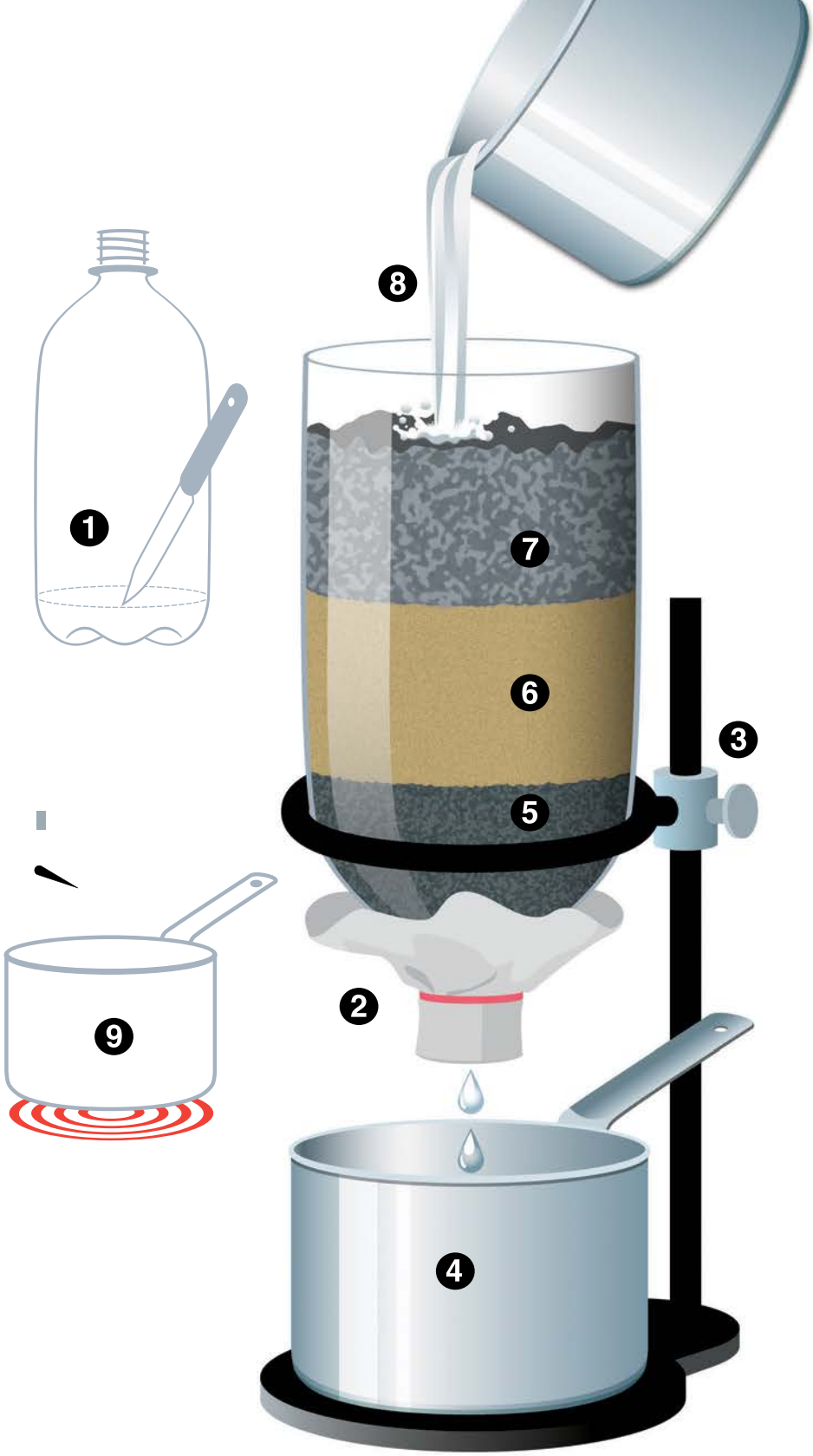
Filtration method

1. Cut off the base of a plastic bottle just above the curve of the bottle.
2. Cover the mouth of the bottle with six or more layers of fine cloth (e.g., cheesecloth) and use a rubber band to secure them.
3. Turn the bottle upside down and support the bottle from falling over.
4. Place a pan under the bottle. Make sure the mouth of the bottle is not submerged in the pan.
5. Add 5 cm to 8 cm of crushed charcoal.
6. Add 8 cm to 10 cm of fine sand.
7. Add 5 cm to 8 cm of gravel.
8. Pour the water into the filter slowly.
9. After the water is filtered, immediately boil the water for 20 minutes.

Boiling method*

1. Bring the water to a rolling boil for 20 minutes.
2. Let the water cool before using.

**Do not use the boiling method if the water is cloudy.*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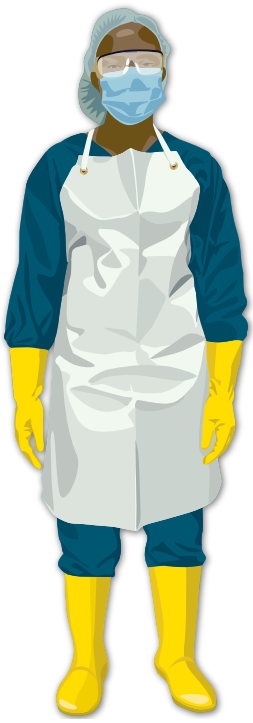
Housekeeping

Making chlorine solution from liquid bleach



1. Put on required personal protective equipment (PPE), including: reusable utility gloves, apron, rubber boots, hairnet, and face protection (goggles or full-length face shield).

2. Determine the percentage of active chlorine solution by reading the active ingredients on the label of the bottle.
(Note: Chlorine solution concentration will vary from approximately 2.4% to 15%.)

Mixing chlorine solution

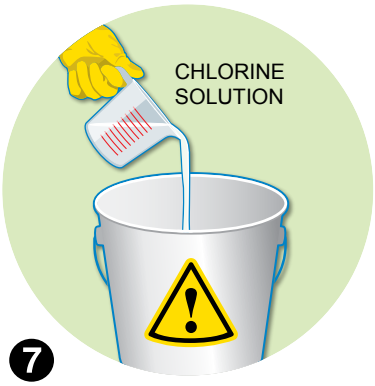
CHLORINE % AVAILABLE	PARTS OF CLEAN WATER TO 1 PART OF BLEACH	
	0.5% SOLUTION	0.1% SOLUTION
2.4%	4	23
3.5%	6	34
3.6%	6	35
5%	9	49
6%	11	59
8%	15	79
10%	19	99
15%	29	149

3. Using the table above, determine the correct amounts of concentrated bleach and clean water required to make the decontamination solution.

4 Measure the appropriate clean water as indicated in Step 3.

5 Carefully pour the clean water into the bucket.

6 Measure the appropriate volume of chlorine solution found on the chart in Step 3.



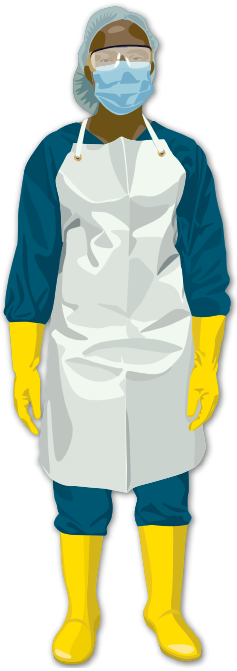
7 Carefully pour corresponding amount of chlorine solution concentrate into the bucket that contains the measured clean water. Use caution to avoid spillage.

8 Use a mixing spoon to gently mix the solution. Solution is now ready for use.

9 To properly dispose of the solution, dilute by adding clean water to top off the bucket. Carefully pour diluted chlorine solution down a utility sink drain or latrine or into a flushable toilet. Avoid splashing. Rinse the toilet or sink carefully and thoroughly with clean water to remove residual wastes.

Note: The chlorine solution should not be reused; a new solution must be made for each cleaning. If visibly contaminated, the solution should be replaced.

Making chlorine solution from powders



1 Put on required personal protective equipment (PPE), including: reusable utility gloves, apron, rubber boots, hairnet, and face protection (goggles or full-length face shield).

2 Determine the percentage of active hypochlorite by reading the active ingredients on the label of the container. (Note: Hypochlorite concentration will vary from approximately 2.4% to 15%.)

Check concentration of the powder you are using.

$$Grams/Liter = \left[\frac{\%\ Dilute}{\%\ Concentrate} \right] x\ 1{,}000$$

Mix measured amount of bleach with 1 liter of clean water.

Example: Make a dilute chlorine-releasing solution (0.5%) from a concentrated powder (35%).

Step A: $Grams/Liter = \left[\frac{0.5\%}{35\%} \right] x\ 1{,}000 = 14.2\ g/L$

Step B: Add 14.2 grams to 1 liter of water.

Mixing chlorine solution

CHLORINE % AVAILABLE	Grams of chlorine powder per liter of water	
	0.5% SOLUTION	0.1% SOLUTION[b]
Calcium hypochlorite (70%)	7.1 g/L[a]	1.4 g/L
Calcium hypochlorite (35%)	14.2 g/L	2.8 g/L
NaDCC[c] (60%)	8.3 g/L	1.5 g/L
Chloramine tablets (1 g per tablet)	20 (tablets) g/L[d]	4 (tablets) g/L[d]
NaDCC tablets (1.5 g per tablet)	4 tablets/L	1 tablets/L

[a]For dry powders, read x grams per liter (example: Calcium hypochlorite 7.1 grams mixed with 1 liter water).
[b]Use boiled clean water when preparing a 0.1% chlorine solution for high-level disinfection (HLD) because tap water contains microscopic organic matter that inactivates chlorine.
[c]Sodium dichloroisocyanurate.
[d]Chloromine releases chlorine at a slower rate than does hypochlorite. Before using the solution, be sure the tablet is completely dissolved.

3 Using the table above, determine the correct amounts of concentrated bleach and clean water required to make the decontamination solution.

4 Measure the appropriate volume of clean water as indicated in Step 3.

5 Carefully pour the clean water into the bucket.

6 Measure the appropriate number of grams of powder found in Step 3.

7 Carefully add corresponding amount of powder into the bucket that contains the measured clean water. Use caution to avoid spilling.

8 Use a mixing spoon to gently mix the solution. Solution is now ready for use.

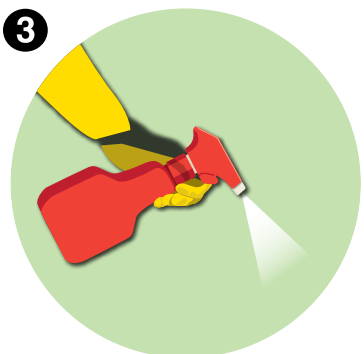
9 After use, dilute the solution by adding water to top off the bucket.
Note: The chlorine solution should not be reused; a new solution must be made for each cleaning. If visibly contaminated, the solution should be replaced.

10 Carefully pour the diluted chlorine solution down a utility sink drain or latrine, or into a flushable toilet. Avoid splashing. Rinse the toilet or sink carefully and thoroughly with clean water to remove residual waste.

Cleaning, rinsing, and disinfecting countertops, floors, and walls

Clean using detergent.
Remove dirt or contamination that you can see.

Rinse using clean water.
Rinse away dirt or contamination and detergents.



Disinfect using approved disinfectant.
Remove contamination that you cannot see and provide future protection.

**It is recommended to use three buckets when cleaning in health care facilities: The first bucket contains a chlorine solution, the second bucket contains clean water (used for rinsing the mop), and the third bucket is empty (used for wringing out the mop).*

Cleaning best practice

1

Use the right product.
Make sure the product is suitable for the surface you need to clean.

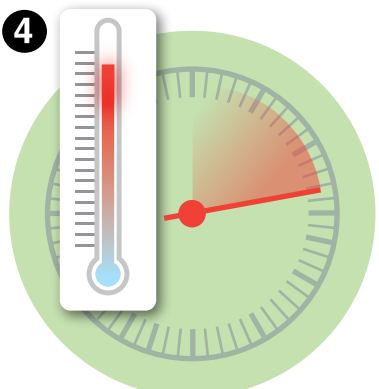
2

Prepare and apply as directed.
Read instructions carefully.

3

Use the right equipment.
Make sure the equipment is suitable for the job and kept clean.

4



Increase contact time and temperature.
Increase detergent contact time and clean water temperature for hard-to-remove dirt or contamination.

Rinsing best practice

1

Use clean water.

2

Use high pressure water if necessary to lift dirt.

3

Rinse to remove lifted dirt and residual detergent.

4

Use hot, clean water to help lift oil or greasy residues.

Disinfecting best practice

1

Use the right product.
Make sure the product is suitable for the surface you need to disinfect.

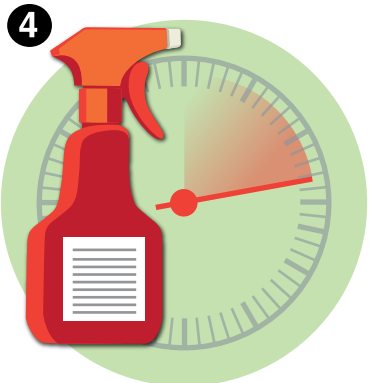
2

Prepare the product as directed.
Read instructions carefully.

3

Apply the product as directed.

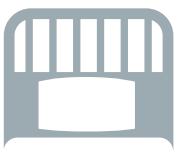
4



Follow product usage instructions for proper contact time.

Processing linens

What is hospital linen?



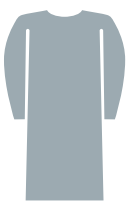
Bedding

Drapes

Towels

Patient gowns

Cleaning cloths



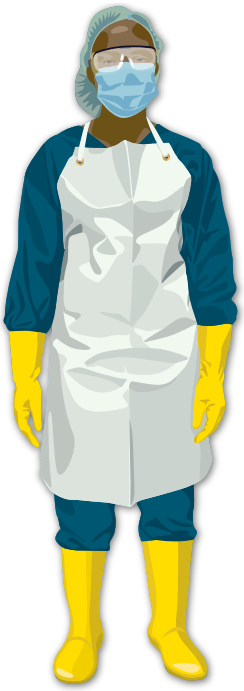
Surgical gowns

Reusable wrappers

Reusable caps

Scrub suits

Reusable masks



Staff requirements

Cap

Goggles

Mask

Plastic **or** rubber apron

Utility gloves

Rubber boots

Training

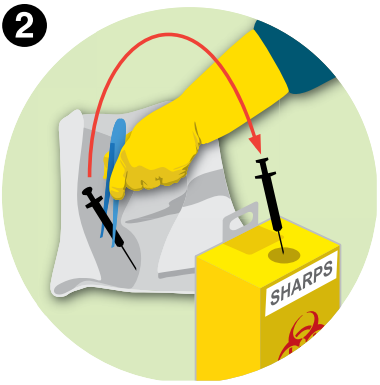
Linen processing best practices

Contain linen for safe handling and transport.

1

Receive and store soiled linen.

2

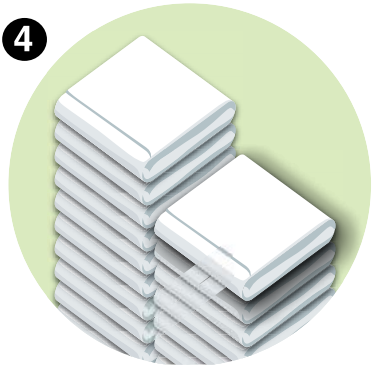


Sort and prepare soiled linen.

3

Decontaminate, clean, and disinfect soiled linen.

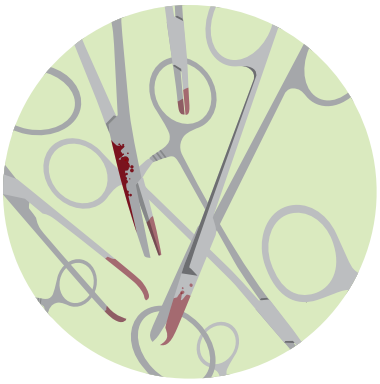
4



Dry, iron, fold, and store clean linen.
Air dry or machine dry per directions.

**Linen processing areas should be separated by physical barriers.*

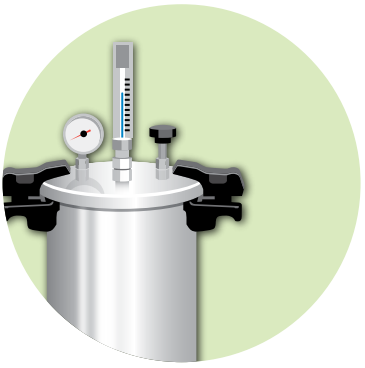
Processing reusable metal instruments



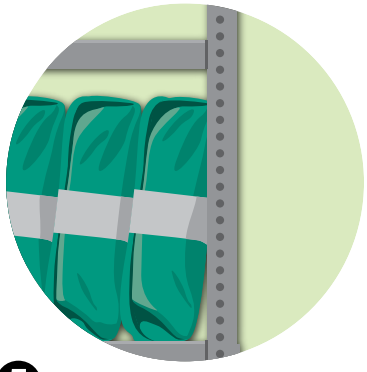
1 Receive the instruments

2 Decontaminate

3 Wrap the instruments



4 Sterilize

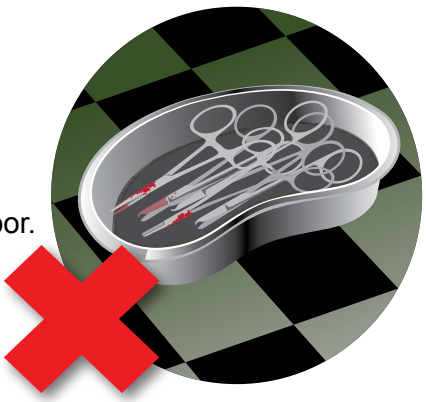


5 Store

Receiving area

Place contaminated instruments in an identified container. Place container on counter.

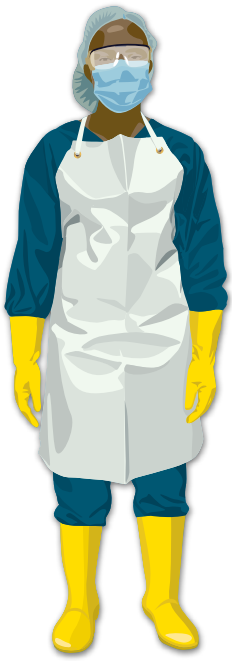
Never place items on the floor.



Ensure proper caution signage is present.

Wear proper PPE when handling contaminated instruments.

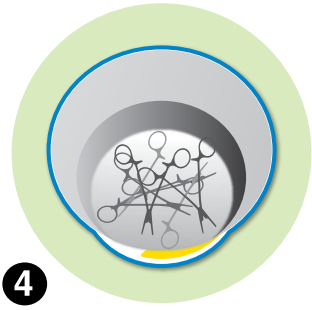
Decontaminating reusable metal instruments



1. Put on required personal protective equipment (PPE), including: reusable utility gloves, apron, rubber boots, hairnet, and face protection (goggles or full-length face shield).

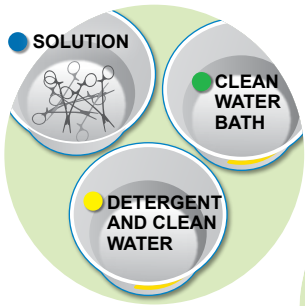
2. Determine the proper procedure for mixing the chlorine solution.

3. Mix chlorine solution according to procedures found on pages 44 and 46.



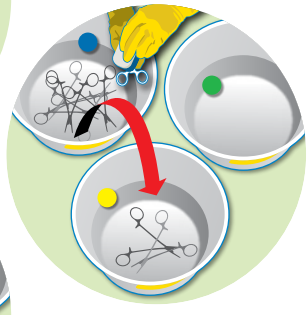
4. Place reusable metal instruments in the prepared decontamination solution for 10 minutes to pre-soak the instruments.

5. Fill a second bucket 3/4 full with water and detergent. Fill a third bucket 3/4 full with clean water.



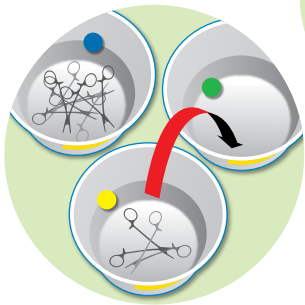
6

To scrub the instruments, place the three buckets next to each other: one bucket with pre-soaked instruments, one bucket with detergent and clean water, and one bucket with clean water for the bath.



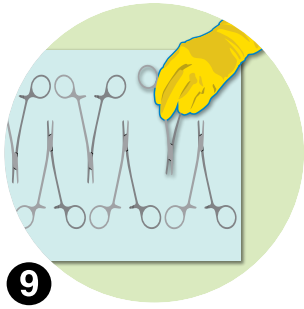
7

Remove half the instruments from the pre-soak solution and place them in the bucket of detergent and clean water. One by one, scrub the instruments thoroughly with a nylon bristle brush until all signs of contaminants have been removed.



8

Place the scrubbed instruments into the clean water bath for rinsing. Repeat this process until all reusable metal instruments have been scrubbed and are placed in the clean water bath.



9

Remove instruments from clean water bath and place them on a clean, dry towel. Inspect instruments for rust, blunting, or residual contamination.

10

Place properly decontaminated reusable instruments in appropriate containers for storage or sterilization. Reusable instruments can be sterilized following the procedure on page 54.

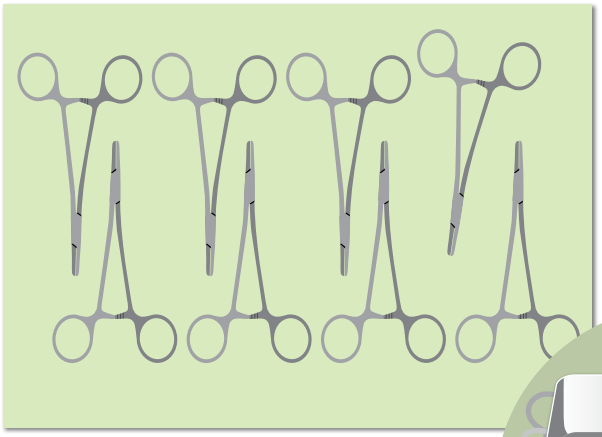
11

After use, dilute the solution by adding water to top off the bucket.
Note: The chlorine solution should not be reused; a new solution must be made for each cleaning. If visibly contaminated, the solution should be replaced.

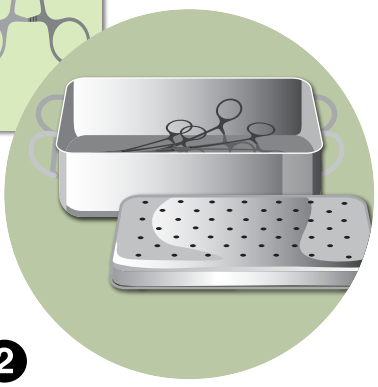
12

Carefully pour diluted chlorine solution down a utility sink drain or latrine, or into a flushable toilet. Avoid splashing. Rinse the toilet or sink carefully and thoroughly with clean water to remove residual waste.

Wrapping of instruments



1. Inspect instruments for contamination and verify that all required instruments are present for kit assembly.



2. Place instruments in autoclave container or carton.

3. Place closed container or carton in center of steam sterilization wrapper.

4. Lift one corner of wrapper, fold over, and tuck under long side of container or carton.

5 Lift left corner of wrapper and fold over container or carton so that the wrapper is flush against the short side.

6 Lift right corner of wrapper and fold over container or carton until wrapper is flush against the short side.

7 Fold extended wrapper inward to make a long V shape.

8 Fold long V back over top of container or carton and tuck underneath into folds.

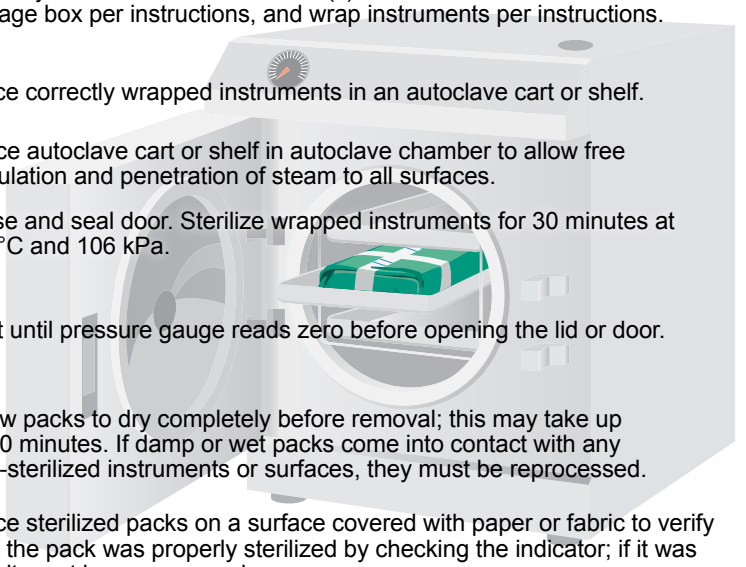
9 Secure this fold with sterilization indicator tape.

10 Secure both sides of the wrapper with sterilization indicator tape. Do not use other tape, pins, clips, staples, or sharp objects.

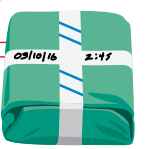
Basic sterilization

Autoclave

1. Properly decontaminate instrument(s) and/or carton or autoclave storage box per instructions, and wrap instruments per instructions.



2. Place correctly wrapped instruments in an autoclave cart or shelf.
3. Place autoclave cart or shelf in autoclave chamber to allow free circulation and penetration of steam to all surfaces.
4. Close and seal door. Sterilize wrapped instruments for 30 minutes at 121°C and 106 kPa.
5. Wait until pressure gauge reads zero before opening the lid or door.
6. Allow packs to dry completely before removal; this may take up to 30 minutes. If damp or wet packs come into contact with any non-sterilized instruments or surfaces, they must be reprocessed.
7. Place sterilized packs on a surface covered with paper or fabric to verify that the pack was properly sterilized by checking the indicator; if it was not, it must be reprocessed.



8. Label the pack with the date sterilized, time, and expiry date.

9. Record sterilization conditions (time, temperature, and pressure) in the logbook.

10. Allow packs to reach room temperature before storing them.

11. Test autoclave daily with biological indicator

**Note: If autoclave is not available, use high-level disinfection methods for instruments.*

High-level disinfection

Boiling

1. Properly decontaminate instrument(s) and/or carton or autoclave container per instructions.
2. Completely immerse instruments in purified clean water with at least 2.5 cm of clean water above the instruments and/or instruments carton.
3. Place lid on pot and bring purified clean water to a rolling boil. (Boiling too vigorously wastes fuel, rapidly evaporates water, and may damage instruments over time.)
4. Once the clean water is at a rolling boil, start timing for 20 minutes and note the time in the high-level disinfection (HLD) logbook.
5. Do not open the pot, remove instruments, or add instruments once the time has begun.
6. After 20 minutes, remove the instruments using forceps or pickups and place in an HLD instrument carton for drying or on a cloth or paper-covered instrument tray for immediate use; never leave instruments in water that has stopped boiling.
7. Once the instruments are dry in the HLD instrument carton, wrap and store them properly.

Chemical (e.g., chlorine solution)

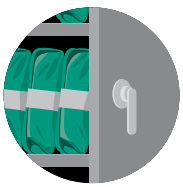
1. Properly decontaminate instrument(s) and/or carton or autoclave container per instructions.
2. Prepare fresh solution of chemical disinfectant (chlorine solution).
3. Submerge clean, dried instruments in chemical disinfectant.
4. Cover container and soak for 20 minutes.
5. Remove instruments from chemical disinfectant with forceps or pickups.
6. Rinse instruments thoroughly with purified water (clean water that has been boiled for 20 minutes) to remove all traces of chemical disinfectant.
7. Place disinfected instruments in a carton and cover to air dry.
8. Use immediately or wrap and label pack for storage.

Storage

Sterilized instruments

Check pack's indicator tape to see if it has changed color, according to the manufacturer's directions.

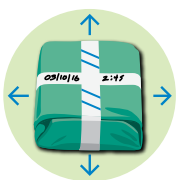
Place date and time on packs before storing.



Limit access to the storage room and/or store items in closed cabinets or shelves. (Enclosed shelves or cabinets are preferred as they protect packs and containers from dust and debris.)

Date and rotate the supplies (first in, first out). This process serves as a reminder that the package is susceptible to contamination and conserves storage space, but it does not guarantee sterility.

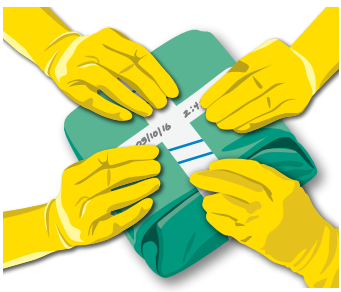
Keep the storage area clean, dry, and dust and lint free. To do this, follow a regular housekeeping schedule.



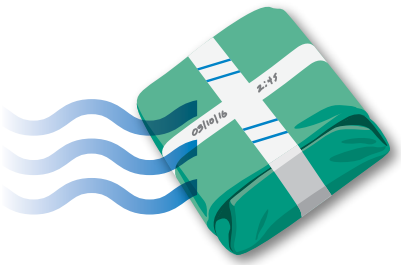
Store packs and containers with sterile or high-level disinfected items 20 to 25 cm off the floor, 45 to 50 cm from the ceiling, and 15 to 20 cm from an outside wall.

Do not use cardboard boxes for storage, as they shed dust and debris and may harbor insects.

The shelf life of a wrapped sterile item is event related. Events that can compromise the integrity and effectiveness of the wrapping, destroying sterility, include:



Multiple handling



Moisture penetration and airborne contamination

Loss of package integrity; developing holes or rupture of seals and/or taping

Becoming dusty, dirty, or wet

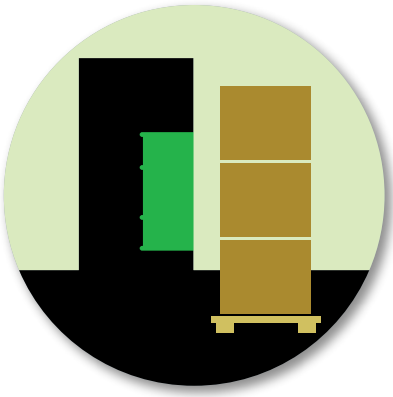
Note: If there is no label with date and time, you must resterilize. If the sterilized instruments have not been used within one week (7 days) of sterilization, sterilization should be done again. As long as the pack remains intact and dry, sterilization can be done of the wrapped pack.

VMMC single-use instruments

Storing single-use male circumcision kits

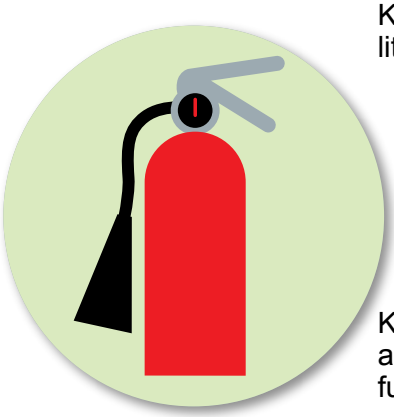
Processing single-use metal instruments

Storing single-use male circumcision kits



Store packaged instruments away from other supplies.

Keep storerooms dry, well lit, and well ventilated.

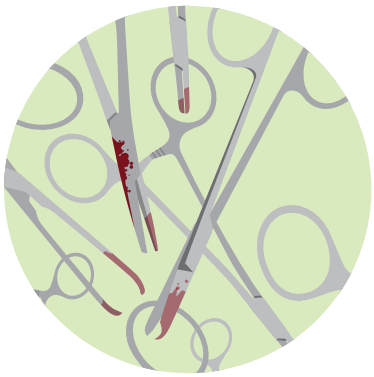


Keep fire safety equipment available, accessible, and functional.

Clean and disinfect storeroom regularly.

Limit storage area access to authorized personnel.

Processing single-use metal instruments



1 Receive the instruments

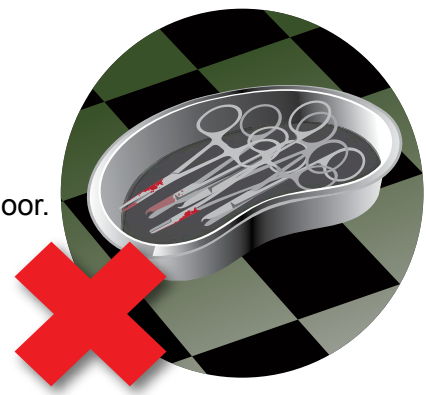
2 Decontaminate

3 Package single-use metal instruments for temporary storage

Receiving area

Place contaminated instruments in an identified container. Place container on counter.

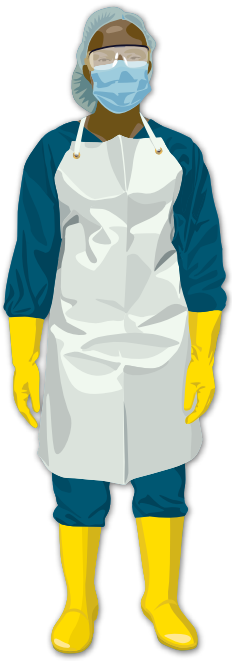
Never place items on the floor.



Ensure proper caution signage is present.

Wear proper PPE when handling contaminated instruments.

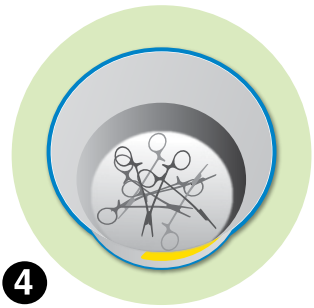
Decontaminating single-use instruments



1. Put on required personal protective equipment (PPE), including: reusable utility gloves, apron, rubber boots, hairnet, and face protection (goggles or full-length face shield).

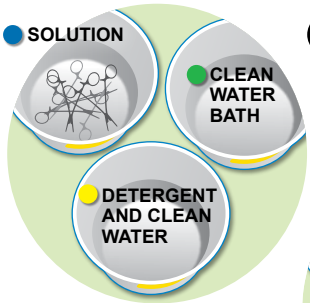
2. Determine the proper procedure for mixing the chlorine solution.

3. Mix chlorine solution according to procedures found on pages 44 and 46.

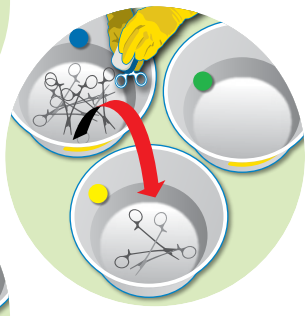


4. Place single-use metal instruments in the prepared decontamination solution for 10 minutes to pre-soak them.

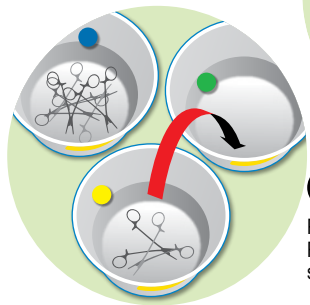
5. Fill a second bucket 3/4 full with water and detergent. Fill a third bucket 3/4 full with clean water.



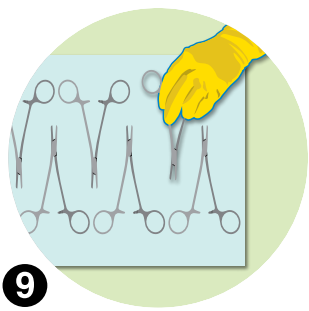
6 To scrub the instruments, place the three buckets next to each other: one bucket with pre-soaked instruments, one bucket with detergent and clean water, and one bucket with clean water for the bath.



7 Remove half the instruments from the pre-soak solution and place them in the bucket of detergent and clean water. One by one, scrub the instruments thoroughly with a nylon bristle brush until all signs of contaminants have been removed.



8 Place the scrubbed instrument into the clean water bath for rinsing. Repeat this process until all single-use metal instruments have been scrubbed and are placed in the clean water bath.



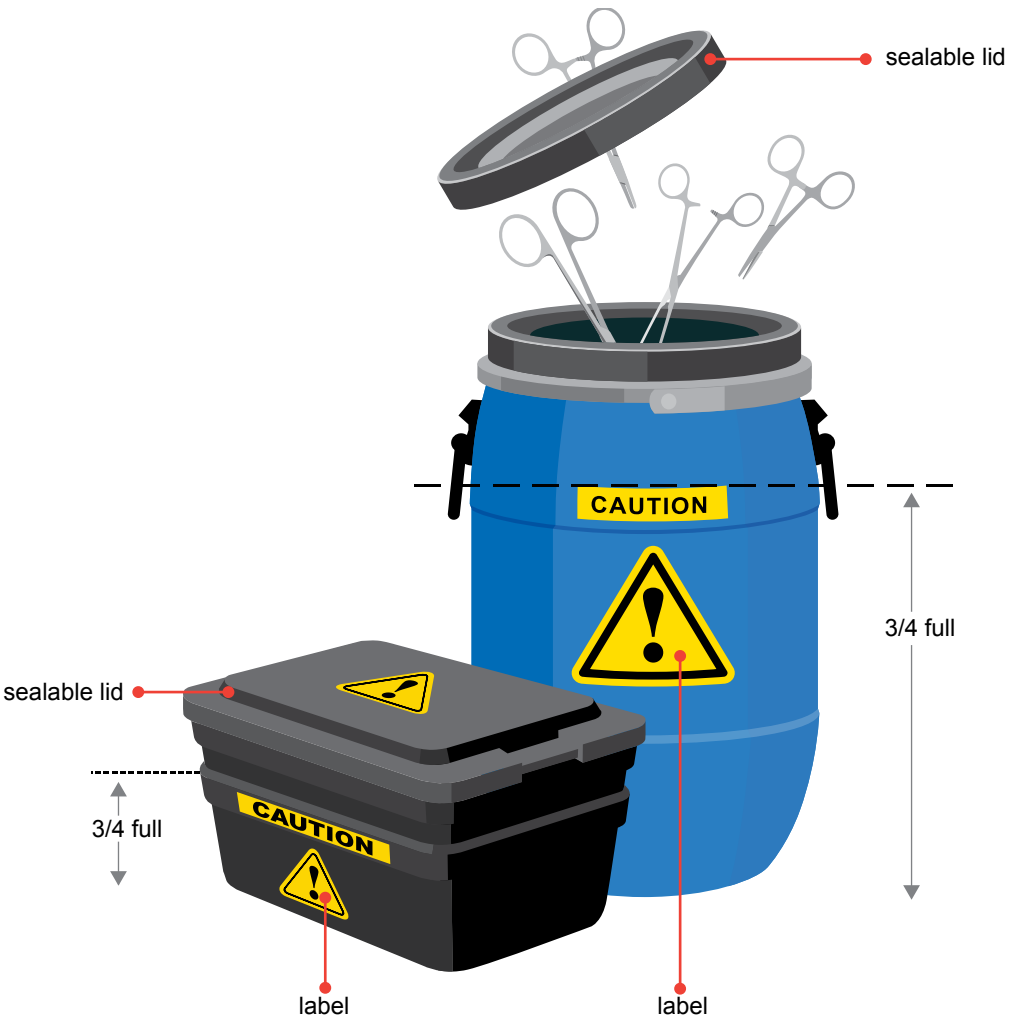
9 Remove instruments from water bath and place them on a clean, dry towel.

10 After use, dilute the solution by adding clean water to top off the bucket.
Note: The chlorine solution should not be reused; a new solution must be made for each cleaning. If visibly contaminated, the solution should be replaced.

11 Carefully pour diluted chlorine solution down a utility sink drain or latrine, or into a flushable toilet. Avoid splashing. Rinse the toilet or sink carefully and thoroughly with clean water to remove residual waste.

12 Place properly decontaminated instruments in a labeled and sealable plastic drum or plastic container.

Packaging single-use metal instruments for temporary storage



NOTE: All instruments MUST be decontaminated appropriately before packaging and storing. The main concern prior to disposal is to ensure the instruments DO NOT, under any circumstances, make their way into the health system for reuse. See pages 64-65 for proper storage requirements.

Site monitoring

Health care waste management evaluation

Health care waste management evaluation

As a health care activity, voluntary medical male circumcision (VMMC) campaigns generate health care waste (HCW). HCW can vary in nature and form, and comprises hazardous as well as non-hazardous elements that require careful handling, treatment, and disposal.

The site monitoring tool (see Annex 2) will assist your VMMC campaign in efficiently evaluating the current health care waste management practices at your campaign sites.

Basic assumptions and objectives

The basic assumption is that in a short period of time (1 hour), by questioning main representatives of the MC site, essential data can be collected to assess the current status of the HCWM practices.

By analyzing each site's HCWM practices, it should be possible to identify where problems remain and what simple, practical actions should be undertaken to solve them.

The aim of this tool is to gather sufficient information to monitor compliance with current SOPs and standards for HCWM at MC sites.

Who can/should use these monitoring tools?

Individuals (VMMC campaign management and/or Infection Control Officer) responsible for the evaluation, oversight, and operation of health care waste management programs constitute the primary audience for this tool.

How to use this tool

Assessment of health care waste management practices should follow four steps to ensure that the procedure will be useful, feasible, ethical, and accurate.

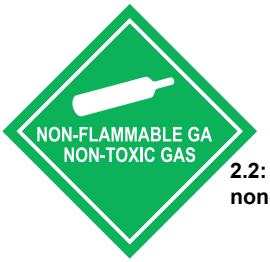
1) Engage all relevant representatives at each location and communicate with these individuals on establishing meeting dates and times as well as findings/results during and after all assessments.
2) Describe the status of findings before leaving a site.
3) Gather credible evidence of defined quality and quantity by filling in as precisely and completely as possible all questions in the tool.
4) Justify conclusions in your final report by giving access to readers of field data collected from each visit.

It is recommended that you review this tool before visiting a location so you are familiar with the content.

Annex 1. Know your hazard symbols

1.1, 1.2, 1.4, 1.5, 1.6: Explosives

2.1: Flammable gases



2.2: Non-flammable, non-toxic gases

2.3: Toxic gases

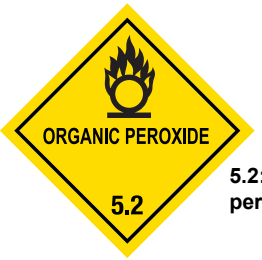
3: Flammable liquids
Liquids with a closed cup flash point not exceeding 60.5° C

4.1: Flammable solids

4.2: Substances liable to spontaneously combust

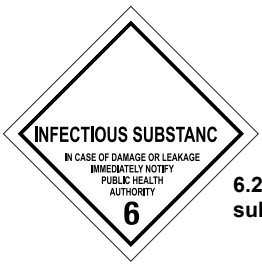
4.3: Substances that, on contact with water, emit flammable gases

5.1: Oxidizing substances



5.2: Organic peroxides

6.1: Toxic substances



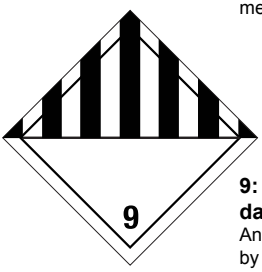
6.2: Infectious substances

7.1: Radioactive material/Level 1
Materials that spontaneously emit ionizing radiation.

7.2: Radioactive material/Level 2
Materials that spontaneously emit ionizing radiation.

7.3: Radioactive material/Level 3
Materials that spontaneously emit ionizing radiation.

8: Corrosives
Substances that, by chemical action, cause damage to living tissue, to commonly used metals, or to other packaging.



9: Miscellaneous dangerous substances
Any substance not covered by all the other classes, but that has been or could be shown by experience to be of such dangerous character that the provisions of this class should apply to it.

Caution

Biological hazards

Cytotoxic or genotoxic waste

Annex 2. Site monitoring tool

No.	Indicators/Variables/Activities	Answer			Details/Justifications/Recommendations (Base responses on observations, particularly areas of concern)
		#	Yes	No	
HCW IDENTIFICATION & SEGREGATION					
1	Are IEC materials on waste management and infection control available and displayed at appropriate locations?				
2	Is HCW (e.g., infectious, sharps, special, chemical/pharmaceutical, and general waste) properly segregated into identified categories?				
3	Is containerization/packaging used correctly for each category of waste?				
7	Have any spillages been reported this month?				
ON-SITE COLLECTION & TRANSPORT OF WASTE					
8	Is waste routinely collected? (e.g., is waste collected on a daily basis and/or once waste bags are three-quarters full?)				
9	Is proper on-site collection equipment available to transport health care risk waste only? (e.g., are there trolleys, carts, wheeled containers?)				
TEMPORARY WASTE STORAGE ROOM MANAGEMENT					
10	Is the storage area secured? (e.g., are storage areas inaccessible to unauthorized persons, animals and insects; are they clearly identified with signage; are they protected from the elements?)				
11	Is the storage area routinely cleared? (e.g., is waste is not piling up or sitting in storage area for extended periods of time?)				
12	Is segregation of waste maintained in storage area? (e.g., is waste segregated into infectious and non-infectious waste; are infectious waste bags and sharps containers properly labeled?)				

No.	Indicators/Variables/Activities	Answer			Details/Justifications/Recommendations (Base responses on observations, particularly areas of concern)
		#	Yes	No	
WASTE TREATMENT & DISPOSAL (FOR SITES WITH INCINERATORS ONLY)					
13	Is the incinerator fully compliant and operating optimally?				
OCCUPATIONAL SAFETY					
14	What is the number of needle stick incidents recorded in the past month as a result of poor waste management?				
15	Are waste handlers and clinical staff using the appropriate personal protective equipment (PPE) when handling waste (e.g., gloves, apron, boots, masks)?				
QUANTIFICATION OF WASTE					
16	Is waste routinely weighed and volumes recorded in waste log?				
17	What is the total monthly weight of sharps waste generated (kg)?				
18	What is the total monthly weight of infectious waste generated (kg)?				
19	What is the total monthly weight of general waste generated (kg)?				
20	What is the total monthly weight of other waste generated (kg)?				
21	How much waste is disposed of, on average, per week?				
LOGISTICS MANAGEMENT					
22	Is the supply of sharps containers sufficient in number?				
23	Is the supply of reusable waste containers/bins sufficient in number?				
24	Is the supply of color-coded liners sufficient in number?				
25	Are reserve stocks available in the store for the above mentioned materials?				

Contributors

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