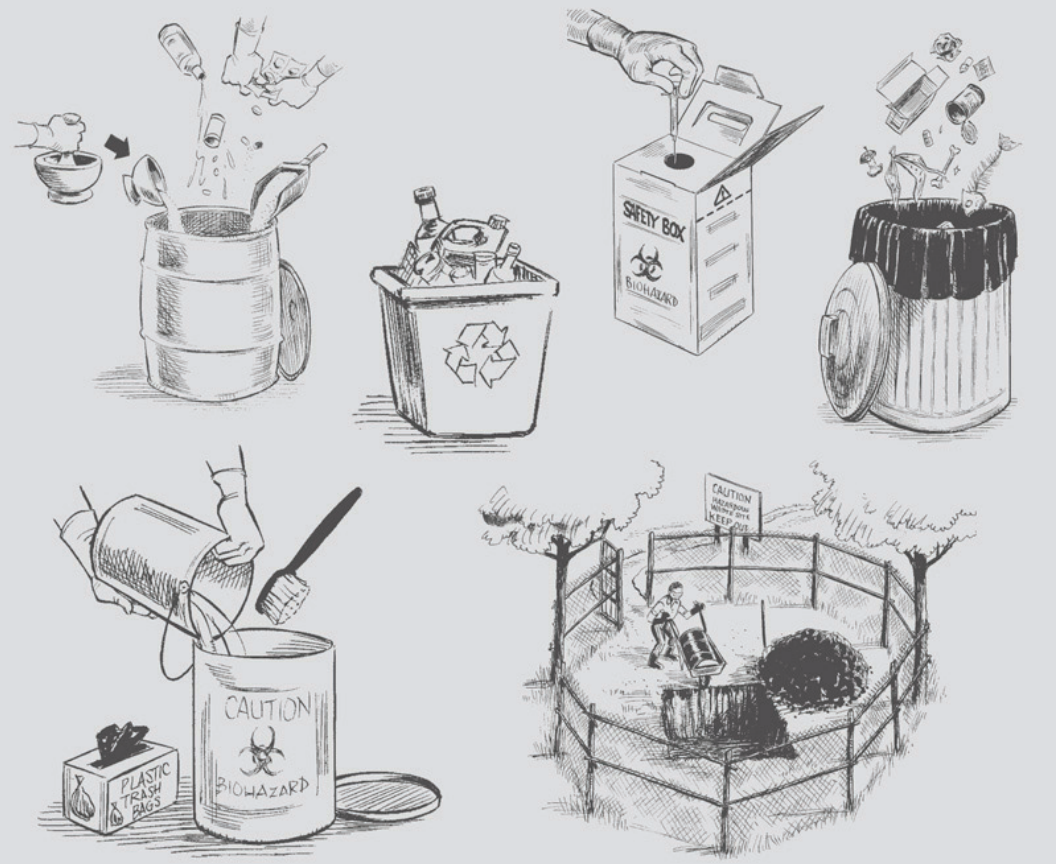
USAID | DELIVER PROJECT

# Guide to Health Care Waste Management for the Community Health Worker

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## USAID | DELIVER PROJECT, Task Order 4

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## Abstract

This guide provides practical guidance for community health workers on how to safely handle and dispose of hazardous waste. It describes the basic principles of waste management and offers solutions for managing the waste generated from everyday activities carried out in the community.

## USAID | DELIVER PROJECT

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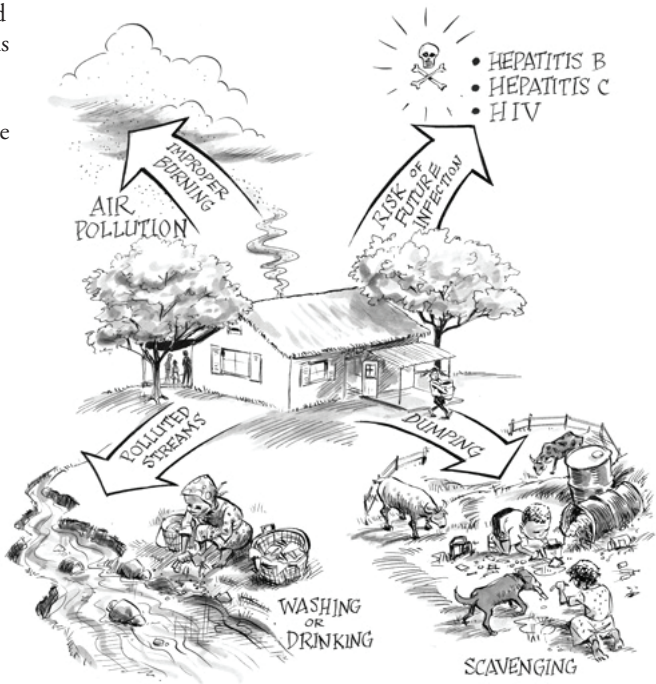
# Introduction

Medical waste can be hazardous; if you do not dispose of it correctly, health personnel, waste handlers, and the community risk being seriously injured or infected. This is true no matter where you provide health care—at the facility or at the community level. Establishing good practices for proper handling and disposal of health care waste is an important part of the health care delivery system.

As part of an organized approach to infection control and environmental protection, you should strictly follow the handling and disposal procedures in this guide. However, if your country has national health care waste management (HCWM) guidelines, policies, and/or standards, you and other community health workers should know and follow the national guideline when managing health care waste.

## *What Are the Risks from Health Care Waste?*

Health care waste can be highly infectious, particularly when contaminated blood or other body fluids result from health care activities. An injury from used sharps (needles, blood collection and infusion sets, and lancets) can transmit serious infectious diseases—hepatitis B, hepatitis C, HIV, and others—to you and other health care support staff—cleaners, waste handlers, laundry workers, and others. If disposed of improperly, scavengers may collect and recycle the used sharps, spreading infectious diseases to patients and the community. Frequently, children are the unfortunate victims of needle-stick injuries from syringes and needles. Another risk is from expired medicines that are often collected and resold if they are not disposed of, creating another public health risk. Finally, unauthorized and improper burning and/or dumping of health care wastes pollutes the air with dangerous gases, contaminating the soil and water with heavy metals and other toxic chemicals, that can enter the food chain, causing respiratory tract diseases and cancer.

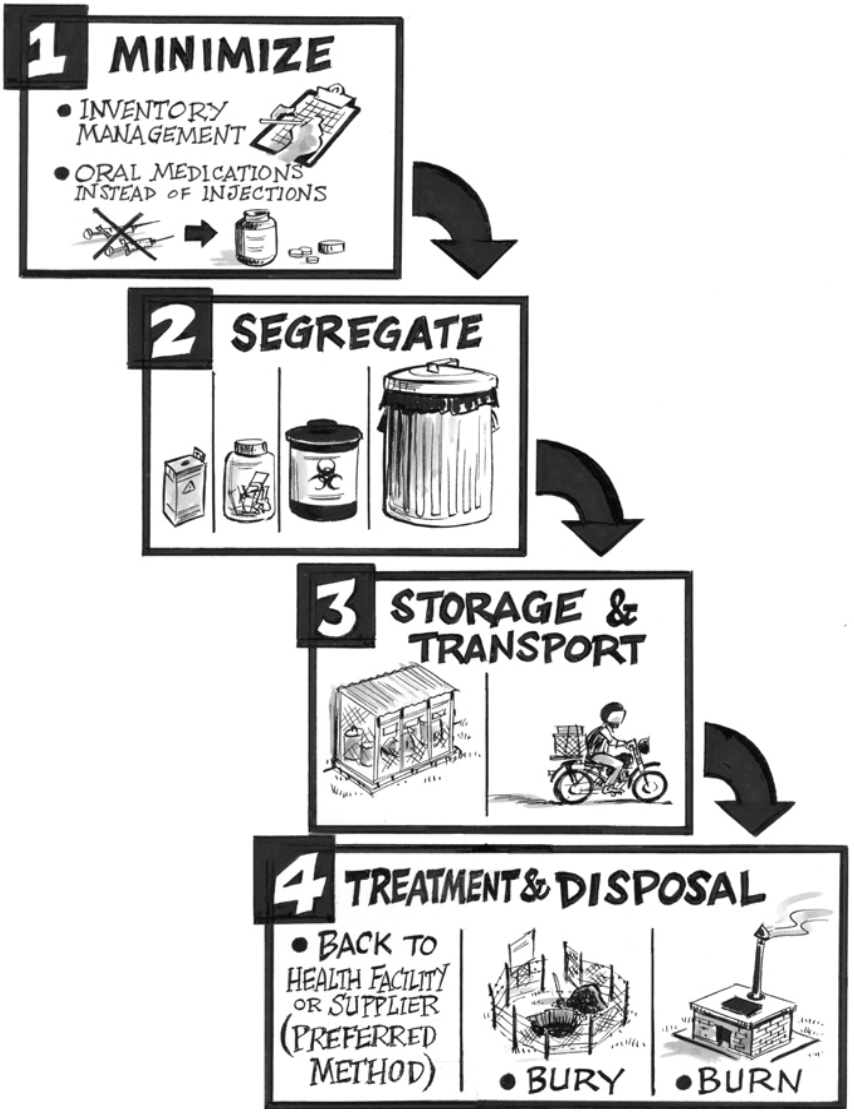



RISKS OF IMPROPER HANDLING AND DISPOSAL OF HAZARDOUS WASTE

## What Is the Role of the Community Health Worker?

This guidance describes the four key steps of health care waste management that you and other community health workers (CHWs) should follow:

- minimization
- segregation
- storage and transport
- treatment and disposal.



This guide describes your role and the role of the CHW in the health care waste management system. For example, if you receive supplies (syringes, needles, and safety box) from the health care facility, you should return the used sharps (in the safety box) to the health facility for treatment and disposal. However, if you do not always receive supplies from a health care facility, but you buy supplies locally, you may need to use other options suggested in this guide (see Treating and Disposing of Waste).

You and other CHWs often work in areas with limited access to formal health services; you may or may not be part of the formal health structure. You may also participate in a wide range of activities, depending on where you work. You may offer home-based health care, first aid and treatment for simple and common ailments; health education, nutrition, and surveillance; family planning activities; communicable disease control; referrals; recordkeeping; and collection of data on vital events (Ofosu-Amaah 1983). You and other CHWs may work in specialized areas—maternal and child health, tuberculosis, malaria, HIV and AIDS care, and treatment of acute respiratory infections (Lehmann and Sanders 2007). Most of these activities generate hazardous waste that may include sharps (lancets, needles, and syringes); bandages; gauze and gloves contaminated with blood or other bodily fluids; and expired pharmaceuticals.

When you handle and dispose of infectious wastes, to protect the workers and the community against potential health hazards, you must establish a system for safe, environmentally sound practices, following the national health care waste management guideline and/or policies (if available). Inappropriate handling and disposal often has serious health and environmental implications. This document offers simple, safe, and practical guidance on how you should handle and dispose of hazardous waste. In addition, if a national guidelines/policies are available, you should have a copy and follow it when you manage waste.

# Managing Health Care Waste

Health care waste includes all the wastes generated by medical activities. For you, this may include waste from rapid tests used to diagnose HIV and malaria; and from medicines used for family planning, immunizations, and curing illnesses, including anatomical waste.

## *Classifying Health Care Waste*

Health care waste can be classified in many ways, but for this guide, it is divided into two categories: hazardous waste (infectious and non-infectious) and non-hazardous waste.

### Hazardous waste (10–25 percent of waste)

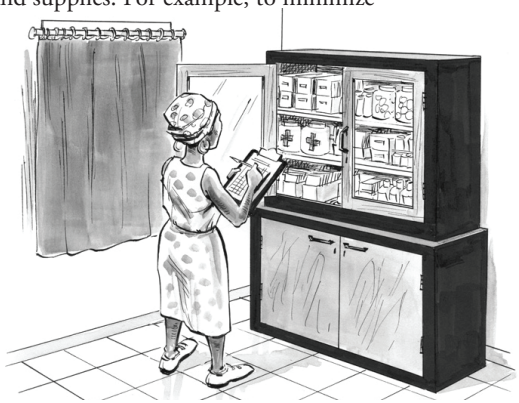
- Infectious hazardous waste:
  - all the waste and instruments that may be contaminated with blood or other bodily fluids
    - sharps infectious waste: any contaminated waste that could pierce the skin: needles, lancets, blood collection and infusion sets, broken glassware, and ampoules
    - non-sharps infectious waste: contaminated gloves, swabs, cotton, bandages, and dressing materials; sputum cups and slides, and anatomical wastes (placenta and excised foreskin from male circumcision).
- Non-infectious hazardous waste:
  - pharmaceuticals: medicines, vaccines, injectable contraceptives, and expired or damaged rapid diagnostic tests (RDTs) that have been exposed to water, crushed, or changed in color.

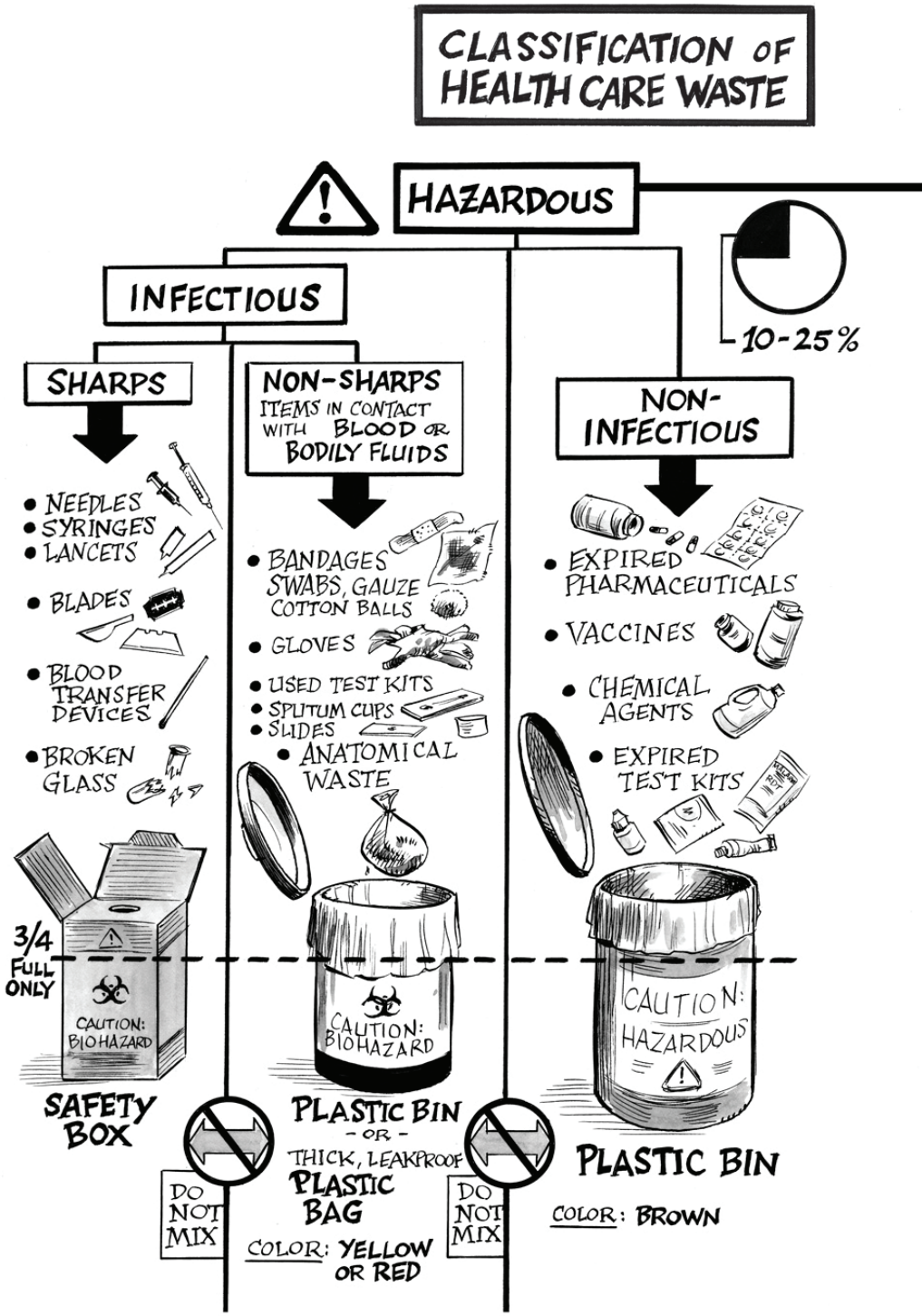
### Non-hazardous waste (75–90 percent of waste)

- General waste:
  - general office waste, rapid test packaging, carton boxes, buffer, uncontaminated glass or metal jars, left-over food.

## *Minimizing Waste*

The most effective way to minimize waste is to consider and plan waste reduction before you purchase health care materials and supplies. For example, to minimize waste from sharps, you could prescribe and use more oral medication (instead of injectable medication). Other easy ways to minimize health care waste is to practice good ordering, and stock and inventory management, which will minimize the risk of expired or unusable medicines and supplies. If you are not in charge of determining the quantities of medicine and supplies you receive, discuss expiry and/or shortage problems with the responsible person.




CLASSIFICATION OF HEALTH CARE WASTE
HAZARDOUS
10-25%
INFECTIOUS
SHARPS
NON-SHARPS
ITEMS IN CONTACT WITH BLOOD OR BODILY FLUIDS
NON-INFECTIOUS
• NEEDLES
• SYRINGES
• LANCETS
• BLADES
• BLOOD TRANSFER DEVICES
• BROKEN GLASS
• BANDAGES SWABS, GAUZE COTTON BALLS
• GLOVES
• USED TEST KITS
• SPUTUM CUPS
• SLIDES
• ANATOMICAL WASTE
• EXPIRED PHARMACEUTICALS
• VACCINES
• CHEMICAL AGENTS
• EXPIRED TEST KITS
3/4 FULL ONLY
CAUTION: BIOHAZARD
CAUTION: BIOHAZARD
CAUTION: HAZARDOUS
SAFETY BOX
PLASTIC BIN
- OR -
THICK, LEAKPROOF PLASTIC BAG
COLOR: YELLOW OR RED
PLASTIC BIN
COLOR: BROWN
DO NOT MIX
DO NOT MIX


NON-HAZARDOUS *
75-90%
• OFFICE WASTE
• PAPER
• PACKAGING MATERIAL
• BUFFER BOTTLES
• UNCONTAMINATED GLASS/METAL JARS
• LEFT OVER FOOD
3/4 FULL ONLY
FRAGI
DO NOT MIX
LARGE BIN OR CARDBOARD BOX
COLOR: BLACK
*WHENEVER POSSIBLE, RE-USE, RECYCLE OR COMPOST

## *Segregating Waste*

Segregation of waste means to separate the waste by type (sharps waste, non-sharps infectious waste, and general waste) and to identify the type of waste, immediately putting all the waste in a safety box and other containers with different colors (if possible). Always segregate waste at the source where the waste is generated. If the separation cannot or does not occur at the source, you must treat the health care waste as if it is infectious and manage the waste as if it is hazardous. This, however, increases total costs and disposal and transport of the waste will be more difficult.

You should also physically arrange the work area so the health care waste can be contained at the point of generation; this will decrease the need to handle hazardous waste and will decrease the chance for needle-stick or other injury.


### Tips for organizing the work area

- Position the safety box within your reach.
- Stand or sit between the patient and all needles or sharp objects.
- When discarding needles, place the safety box with the entrance hole of the safety box visible. If you stand while giving injections, place the safety box on the table. If sitting, place the safety box on the floor.

In many health facilities, staff use different colored bags to identify and segregate waste. For example, keep infectious and potentially infectious waste in yellow or red containers/bags with a biohazard logo; place non-infectious general waste in black containers or bags. Brown bags are often used for pharmaceutical and chemical waste. If colored bins or bags are not available, use a labeling system that will differentiate the bin or bags used to collect the different types of waste.

### Infectious hazardous waste—sharps

Immediately dispose of sharps waste in safety boxes. If standard safety boxes are unavailable, use alternative containers—plastic bottles or other containers suggested in this guide.

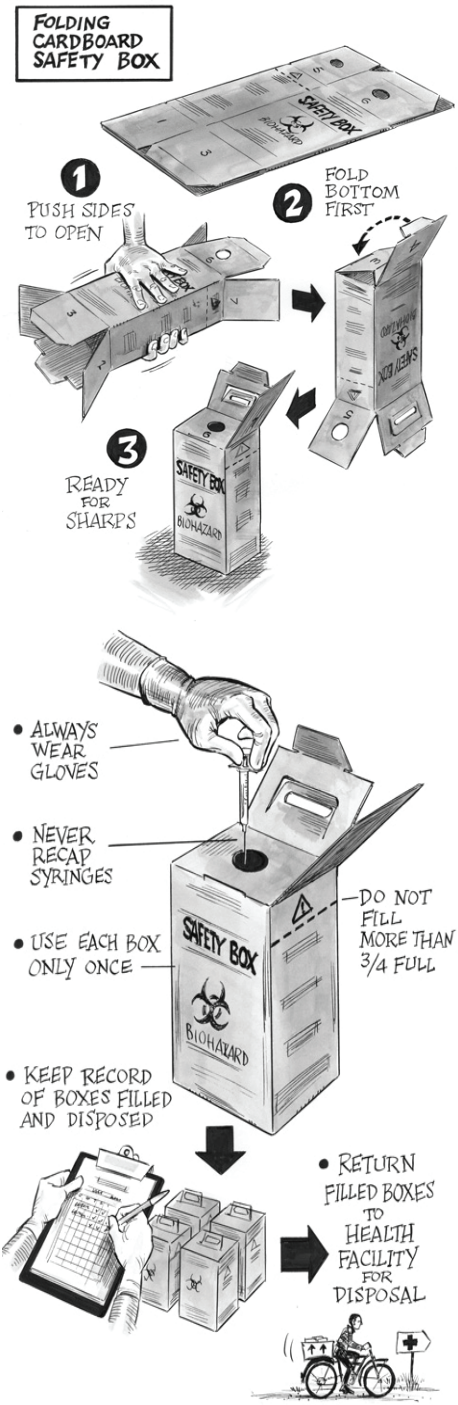
#### *Basic instructions for safety boxes*

- Always wear gloves when handling needles and syringes.
- Collect sharps (lancets, needles, scalpels) separately in a safety box; fit the box with a secure cover.
- Correctly assemble the safety boxes. Different safety boxes are assembled in different ways and instructions are usually printed on each box.
- Never overfill safety boxes. When the safety box is ¾ full, seal the opening and safely store the containers in a safe, secure, dry place, out of the reach of children and stray animals. If you can, put the filled container in a locked closet or room.

- Never overfill a safety box or try to force sharps through a blocked entry hole.
- Return the filled safety boxes to a health facility that has an incinerator and ash pit for treatment (disinfection) and final disposal.

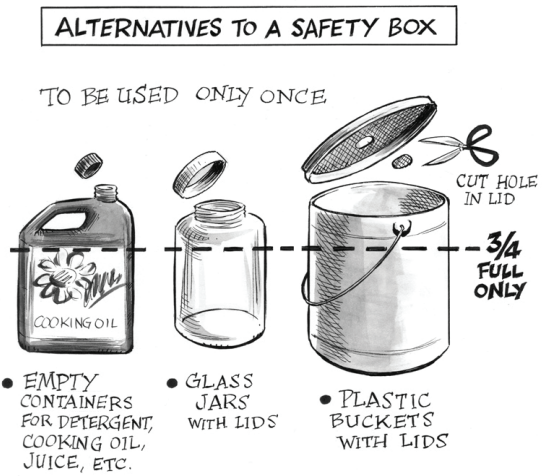
***Additional instructions for using sharps and safety boxes***

- Place all syringes, including retractable syringes, in a safety box.
- Keep a record of every safety box that is filled and discarded.
- Take extra care when handling the safety box; hold it on the top.
- Do not recap syringes (if you must recap the syringe, use the one-handed scoop technique. Place the cap on a flat surface and remove your hand from the cap; with one hand hold the syringe and use the needle to *scoop up* the cap. When the cap covers the needle completely, use the other hand to secure the cap on the needle hub. Be careful to handle the cap at the bottom only (near the hub).
- Do not carry used syringes around the work site.
- Do not hold the safety box in your hand when inserting the needle into the box opening.
- Do not manually bend or remove the contaminated needle from the syringe, or save the needle for later removal.
- Do not empty or reuse the safety box (always dispose of entire box and its contents).
- Do not shake, crush, sit, or stand on the safety box.
- Do not put the following items in a safety box (discard in non-sharps infectious or general waste containers):
  - empty vials
  - discarded vaccine vials
  - cotton pads
  - compressors
  - dressing materials
  - latex gloves
  - any plastic materials or waste products.



If proper safety boxes are not available, use thick puncture-resistant, leak-proof plastic bottles, or glass jars with a lid. You can use a plastic bucket with a round hole cut in the lid, or other reusable heavy or puncture proof plastic container with holes cut in the top (medicine jars, empty detergent/ disinfectant containers, empty cooking oil containers, etc.).

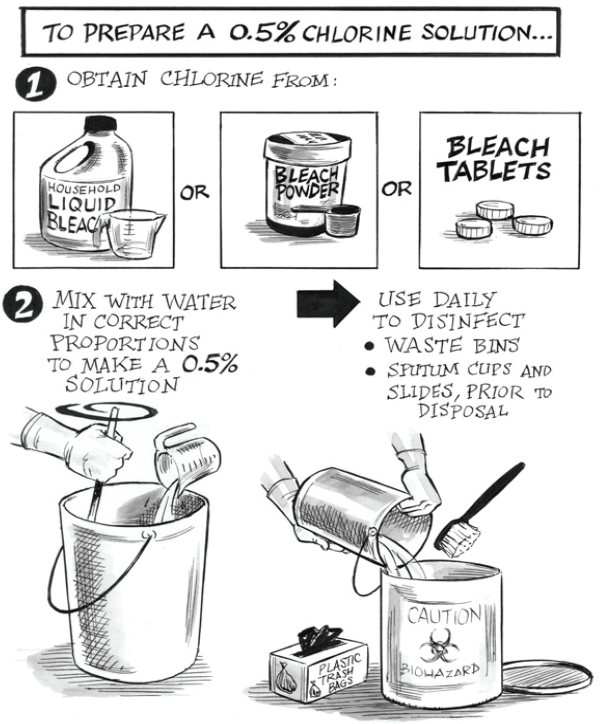
Never empty these containers and never reuse any container that has been used as a safety box. When the containers are ¾ full, if possible, dispose of them in a cement-lined pit (see disposal section) or return to your supplier.



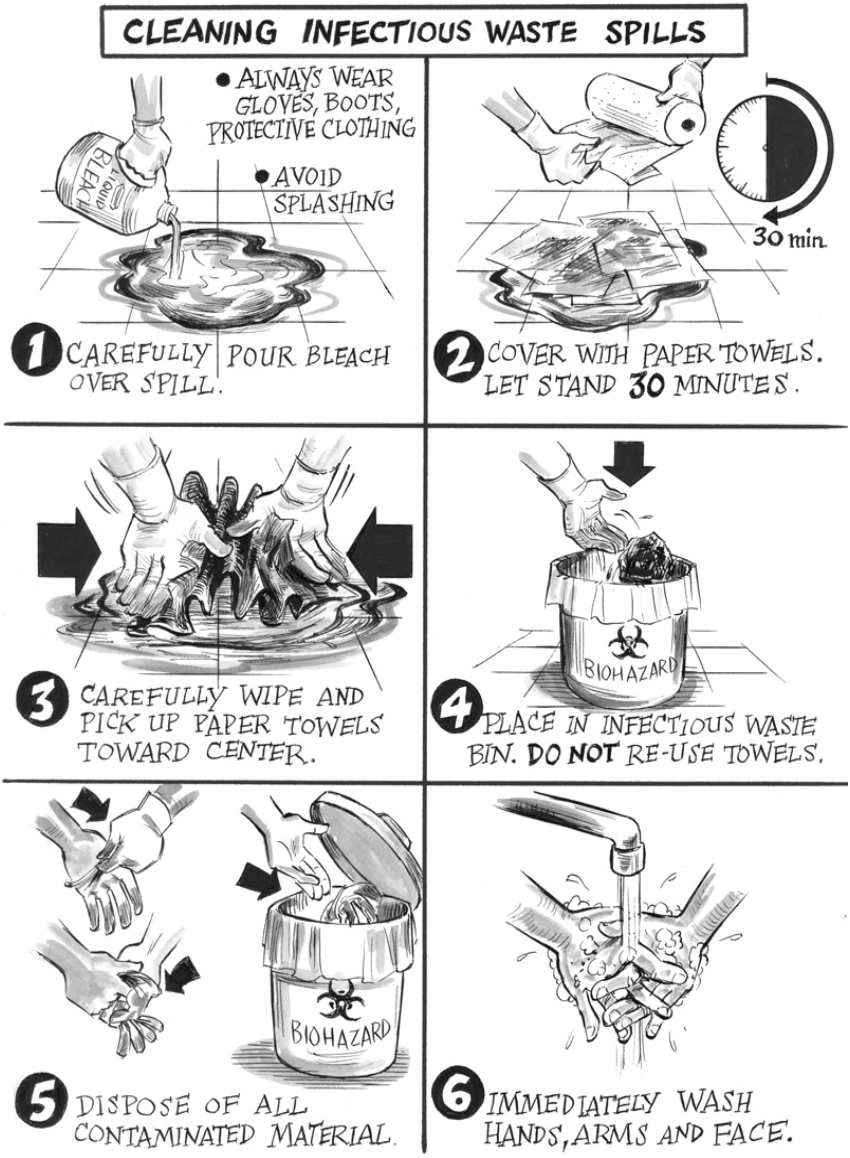

**Non-sharps infectious hazardous waste**

If you use a bin, empty it every day and clean it with 0.5% chlorine solution (bleach). If using a plastic bag, change the bag at the end of each day. If possible, use only high-quality plastic bags that do not rip. In all cases, do not overfill the plastic bags or bins; when ¾ full, close the container and remove. Do not reuse the bag.

- Collect infectious waste (used test kits, bandages and gauze, swabs, gloves, sputum cups, and slides) in a strong, leak-resistant plastic bag placed in a metal or plastic bin with a lid. A red bag is commonly used for general infectious waste; a yellow bag is commonly used for infectious anatomical waste, such as placenta or excised foreskin from male circumcision.
- When the plastic bag is ¾ full, close it, and remove it from the bin.
- Store the closed bin in a safe place, out of the reach of children and stray animals.
- While wearing gloves, disinfect the bin with 0.5% chorine solution (bleach) before putting in a new plastic bag.



- If possible, bury anatomical waste in a secured burial pit.
- If waste is burned onsite, consider separating the plastic infectious waste from the non-plastic waste (not including sharps, such as needles from syringes). Non-plastics can be burned on site; do not burn plastics.
- If sputum cups and slides are segregated, disinfect them with 0.5% chlorine solution (bleach) for at least one hour, prior to disposal.



### *Cleaning infectious waste spills*

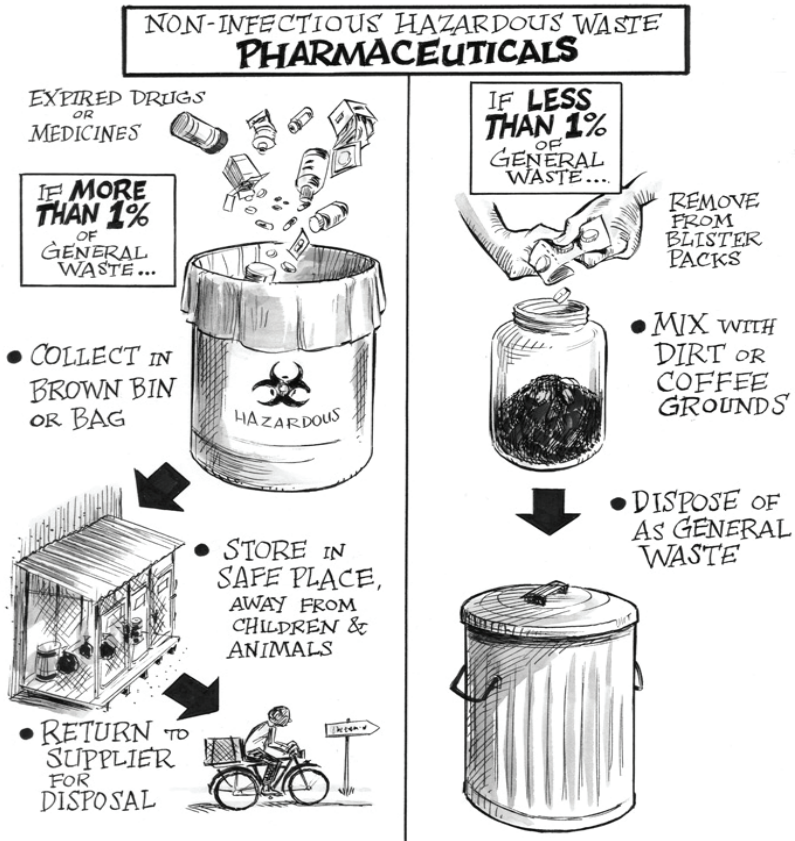
If liquid infectious waste—blood, body fluids, pus, or discharge—are spilled, do the following:

- If possible, wear protective clothing—overalls or industrial aprons, boots, goggles, and heavy duty gloves—while handing infectious waste.
- To avoid splashing, carefully pour liquid bleach or bleach powder on the spill; cover the area with paper towels and leave it for 30 minutes.
- After 30 minutes, wearing heavy-duty gloves, wipe the area and pick up the paper towels, disinfectant, and spilled material; work toward the center of the spill carefully to minimize splashing and splattering of the spilled material.
- Place all the material in a plastic liner or infectious waste bin. Do not reuse any cloth that was used to clean the spill.
- If broken glass or other sharp objects are present, use a mechanical device—brush and dustpan, tongs or forceps—to pick up the waste. Dispose of any sharps in a safety box.
- Remove all personal protective equipment with care to avoid contamination; fold the contaminated area inward.
- Place all disposable personal protective equipment inside a plastic liner within a reusable container for disposal.
- Close all plastic liners and bins.
- Immediately, wash all body parts, including arms, face, and hands.

### Non-infectious hazardous waste

Most pharmaceuticals (drugs or medicines) become less effective after their expiry date; under most circumstances, they are not toxic and are relatively harmless to the environment if disposed of properly. However, there are a few pharmaceuticals that do become toxic when they expire (tetracycline), or are toxic originally (antineoplastics-cancer medicines); dispose of them with caution. Whenever possible, return expired or damaged medicines to their source for proper disposal. Keep them in a secure place to prevent the products from being diverted into unofficial markets for resale. Dispose of these products in the following ways:

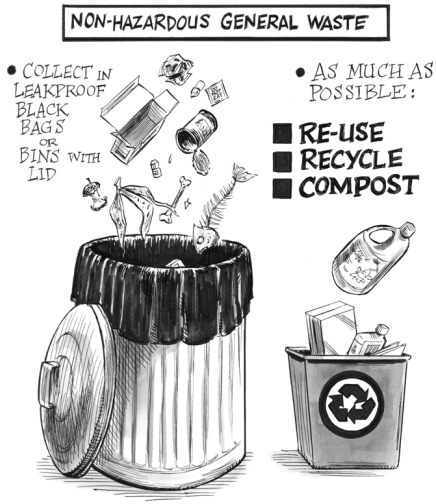
- Collect in a brown bin or bag, if available.
- Store in a secure, safe place, out of the reach of children and stray animals.
- Return as much of the pharmaceutical waste to the supplier as possible.
- If only a small amount is involved (1% or less of the general waste)—
  - Remove the medicine from the container or blister pack and mix with something that will hide the medicine or make it unappealing, such as used coffee grounds or dirt; place the mixture in a container, such as a sealed plastic bag, and place the container in the general waste bin.
  - For liquid waste (diluted liquids, syrups, intravenous fluids, small quantities of diluted disinfectants), dispose of them in the sewer system or waterway. Do NOT dispose of antineoplastics, undiluted disinfectants, and antiseptics in this way.




- For large amounts of pharmaceutical waste, use the following options described under the Disposal section:
  - encapsulate
  - inertize.

### Non-hazardous general waste

Non-hazardous general waste (e.g., packaging, desiccant, and buffer) is regular solid household waste. It does not require any special processing; it can be collected using a bin, plastic bag, or other collection device (e.g., cardboard box). Make sure the color of the bin or plastic bag is noticeably different from the bag or bin you are using to collect infectious waste; the bins and bags



for non-hazardous general waste are usually black. Dispose of the waste in a burial pit onsite, or send it to a municipal waste processing site.

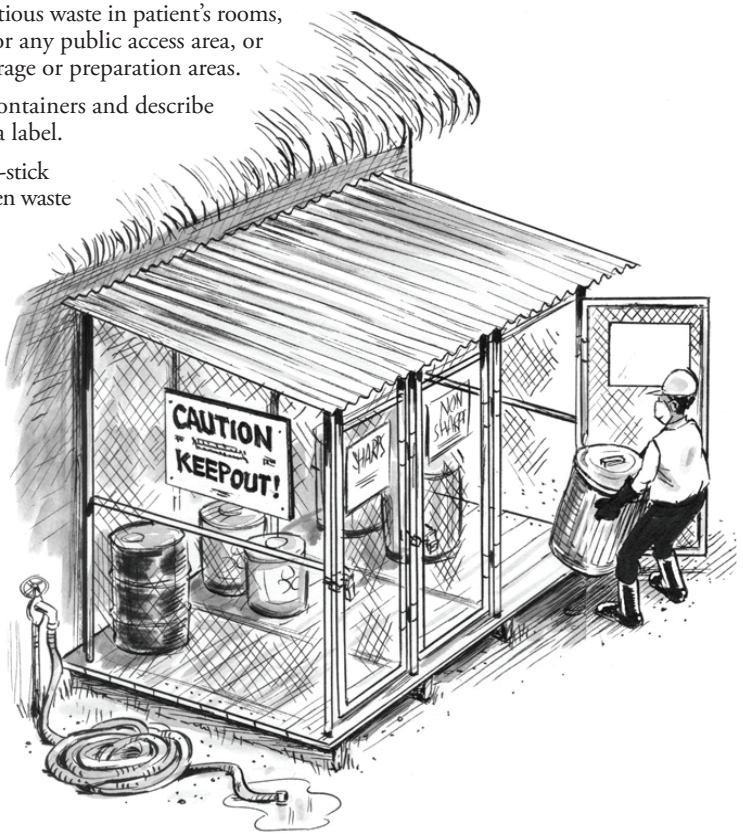
- Recycle, reuse, or compost as much of the general waste as possible.
- Collect in leak-proof black bags or bins with a lid, if they are available.
- Dispose of the waste in a burial pit onsite, or send it to a waste disposal location offsite.

## *Storing and Transporting Waste*

Never allow waste to accumulate at the point of generation. To prevent waste from accumulating, collect it daily, or as often as possible.

### Store infectious waste before final disposal

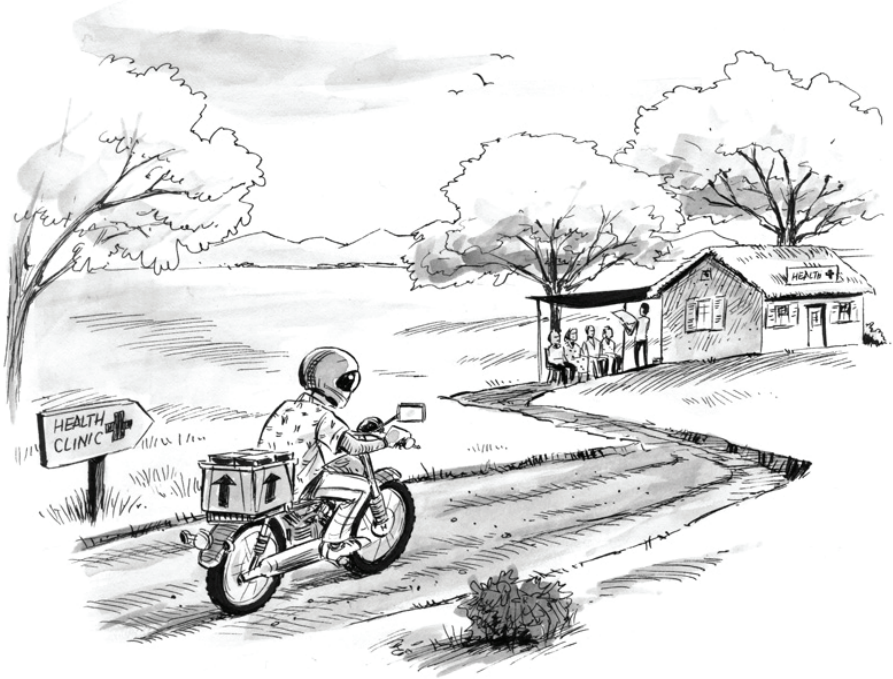
- Do not mix infectious waste with non-infectious general waste; store them in different locations.
- Clearly mark the storage area for infectious waste (for example, Caution: Infectious Waste Storage Area. Unauthorized Persons Keep Out.). Limit access to authorized personnel and keep the area locked, if possible.
- Ensure that storage areas are easy to clean; have good lighting and ventilation; and take steps to prevent rodents, birds, and or insects from entering.
- Never store infectious waste in patient's rooms, function room, or any public access area, or close to food storage or preparation areas.
- Close all waste containers and describe the contents on a label.
- To avoid a needle-stick injury, do not open waste containers when sorting or emptying.
- Periodically clean and disinfect



the storage area.

**Proper handling and transportation**

- Keep all sharps in the safety box or sharps box; properly close the box after opening.
- Make sure the carts and vehicles used to transport waste have smooth edges; check for sharp edges that could tear or damage waste boxes or bags.
- During transportation (i.e., bicycle or motorcycle) fasten the safety/sharps box securely in an upright position.
- If possible, wear protective clothing while handing the sharps and infectious waste containers—overalls or industrial aprons, boots, and heavy-duty gloves.

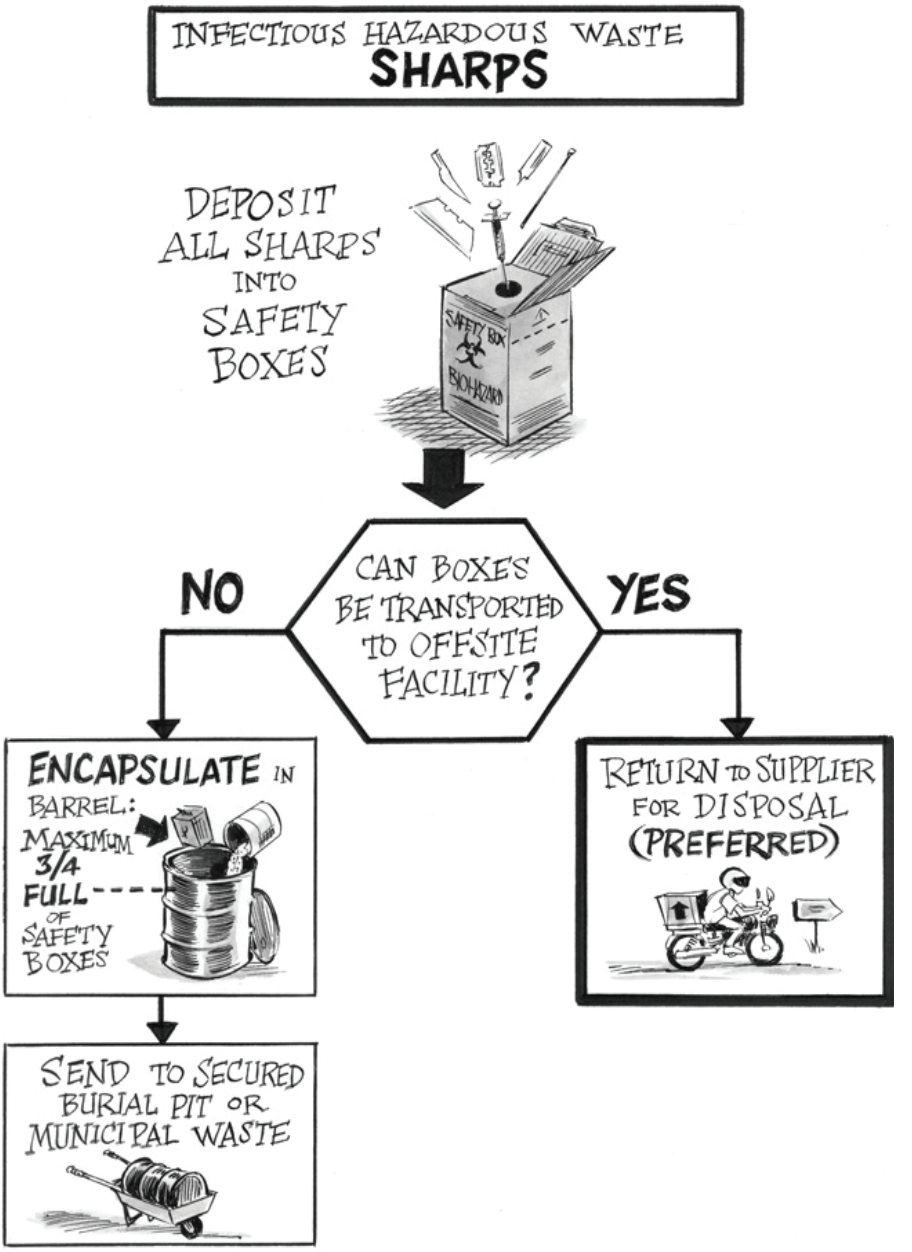



- Never take home any protective cloths that were used to handle waste.

## *Treating and Disposing of Waste*

The best way to dispose of hazardous waste depends on your local conditions and regulations. This section describes several disposal options. Unless local procedures dictate other methods, use the preferred methods that are in bold. In most cases, send the waste back to the facility that provided the supplies. If this is not possible, this guide offers other options.

If the medicines and supplies (RDTs and safety boxes) come from the health facility, return the infectious sharp wastes (e.g., used syringes and needles) to the health facility for treatment and disposal.


INFECTIOUS HAZARDOUS WASTE
SHARPS
DEPOSIT ALL SHARPS INTO SAFETY BOXES
SAFETY BOX
BIOHAZARD
CAN BOXES BE TRANSPORTED TO OFFSITE FACILITY?
NO
YES
ENCAPSULATE IN BARREL: MAXIMUM 3/4 FULL OF SAFETY BOXES
SEND TO SECURED BURIAL PIT OR MUNICIPAL WASTE
RETURN TO SUPPLIER FOR DISPOSAL (PREFERRED)

# INFECTIOUS HAZARDOUS WASTE
# NON-SHARPS

COLLECT WASTE IN LEAK-PROOF BAGS AND BINS


- ITEMS IN CONTACT WITH **BLOOD** OR BODILY FLUIDS
- USED BANDAGES, GAUZE, SWABS
- USED GLOVES
- USED TEST KITS
- **ANATOMICAL** WASTE*

CAN WASTE BE TRANSPORTED TO **OFFSITE** FACILITY?

**NO**

**YES**

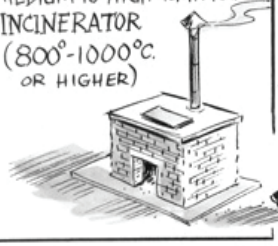
IS AREA DENSELY POPULATED (PEOPLE LIVING WITHIN **50 MILES**)?

**NO**

**YES**

TRANSPORT TO OFFSITE FACILITY FOR DISPOSAL (PREFERRED)

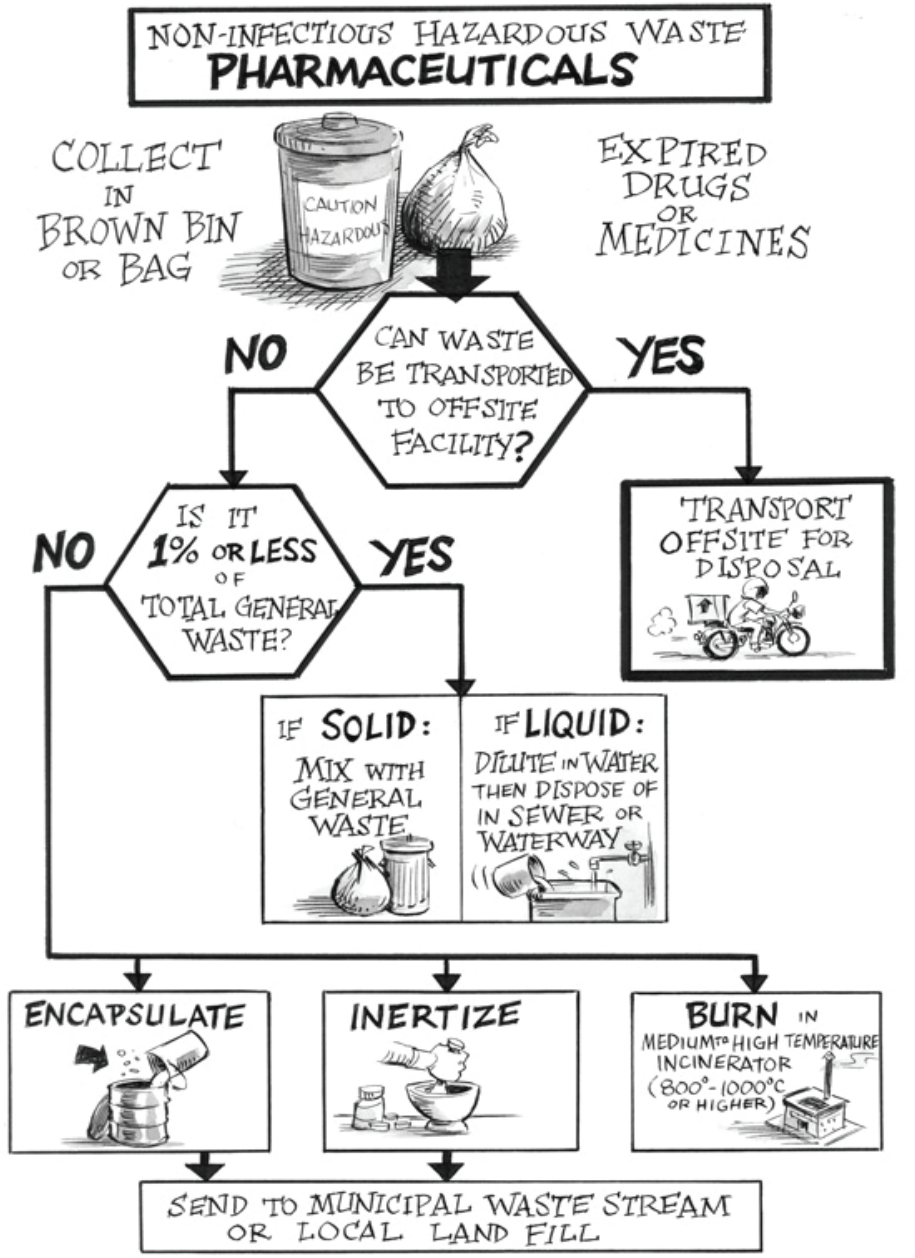
**BURN** IN MEDIUM TO HIGH TEMPERATURE INCINERATOR (800°-1000°C. OR HIGHER)



TAKE ASHES TO BE BURIED

**BURY** IN SECURED BURIAL PIT

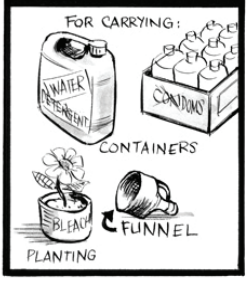

***BURIAL** IS THE PREFERRED METHOD TO DISPOSE OF **ANATOMICAL WASTE.**


NON-INFECTIOUS HAZARDOUS WASTE
PHARMACEUTICALS
COLLECT IN BROWN BIN OR BAG
CAUTION HAZARDOUS
EXPIRED DRUGS OR MEDICINES
NO
CAN WASTE BE TRANSPORTED TO OFFSITE FACILITY?
YES
NO
IS IT 1% OR LESS OF TOTAL GENERAL WASTE?
YES
TRANSPORT OFFSITE FOR DISPOSAL
IF SOLID: MIX WITH GENERAL WASTE
IF LIQUID: DILUTE IN WATER THEN DISPOSE OF IN SEWER OR WATERWAY
ENCAPSULATE
INERTIZE
BURN IN MEDIUM TO HIGH TEMPERATURE INCINERATOR (800°-1000°C OR HIGHER)
SEND TO MUNICIPAL WASTE STREAM OR LOCAL LAND FILL

NON-HAZARDOUS
# GENERAL WASTE

AS MUCH AS POSSIBLE...

## RE-USE




## RECYCLE

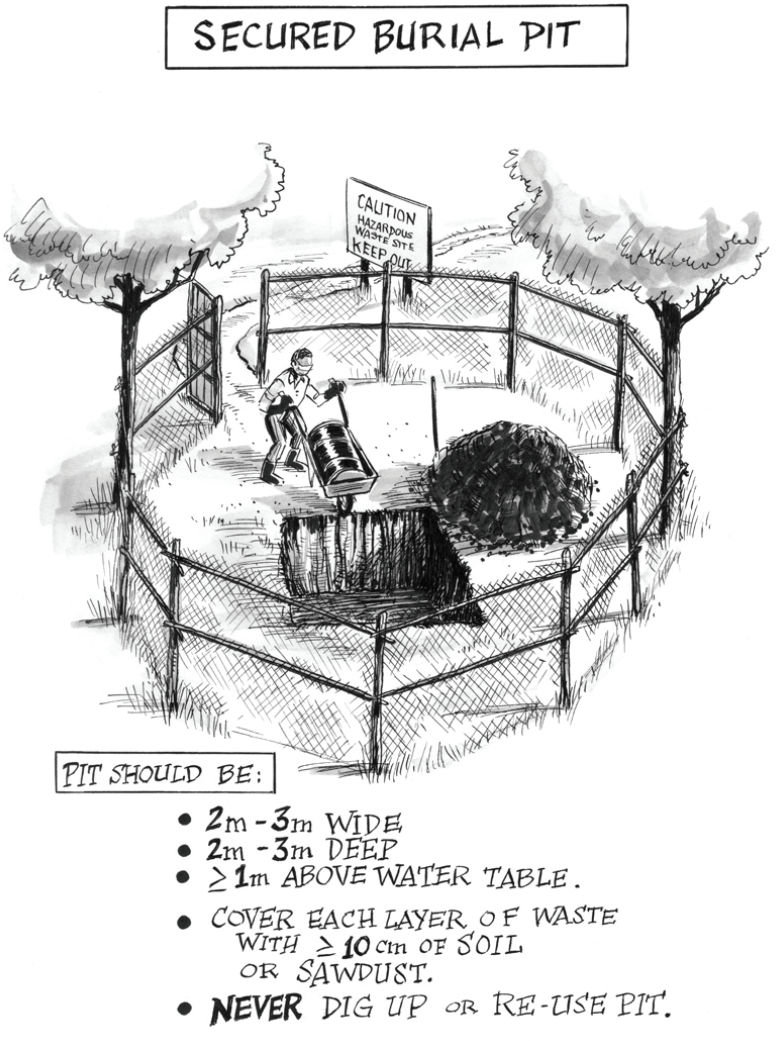
## COMPOST

REMAINDER CAN GO TO
MUNICIPAL WASTE STREAM
OR LOCAL LAND FILL

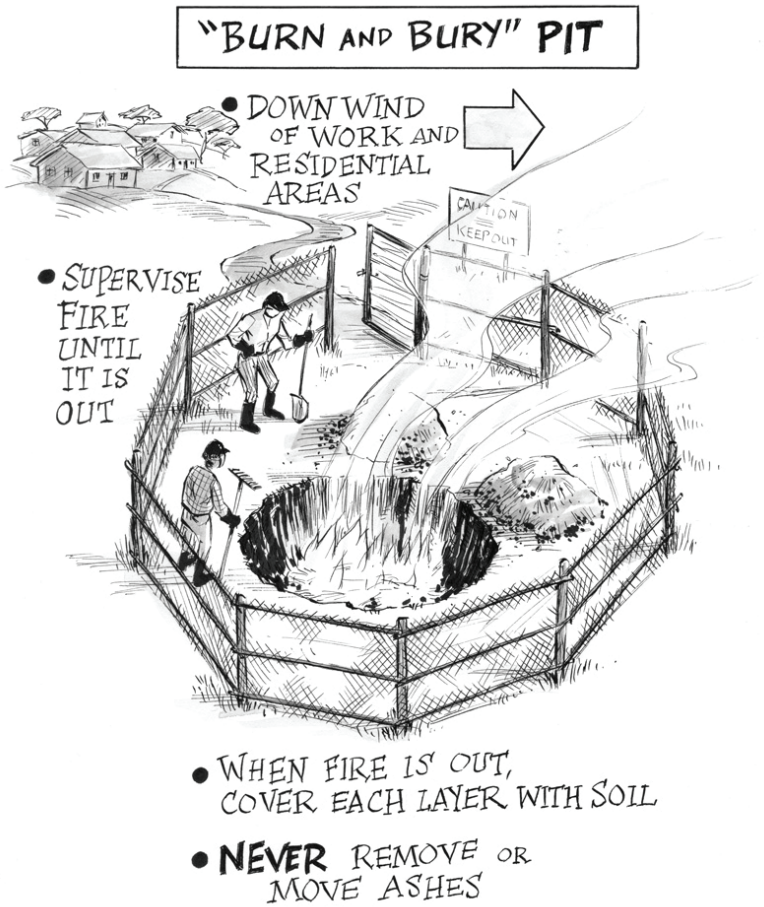
**Disposal and treatment methods**

***Secured burial (disposal method)***

Dig or select a place for the burial pit in the area where you provide the services; ensure that people and animals cannot go near the area. Make sure the pit area is secured and surrounded by a fence (chain-link fence, scrap metal, wood, or a living fence [trees, cactus, thorn, grass, or sisal]). To prevent contamonation by groundwater, use a layer of cement or clay to line the pit (see illustration below), or seal it. Dig a pit 2–3 meters deep, 2–3 meters wide, and >1.5 meters above the water table. Immediately cover each layer of waste with a layer of soil or saw dust (>10 centimeters). If possible, when the pit is full, fill in the site with concrete. After it is filled, *never* dig up the site or use it again.

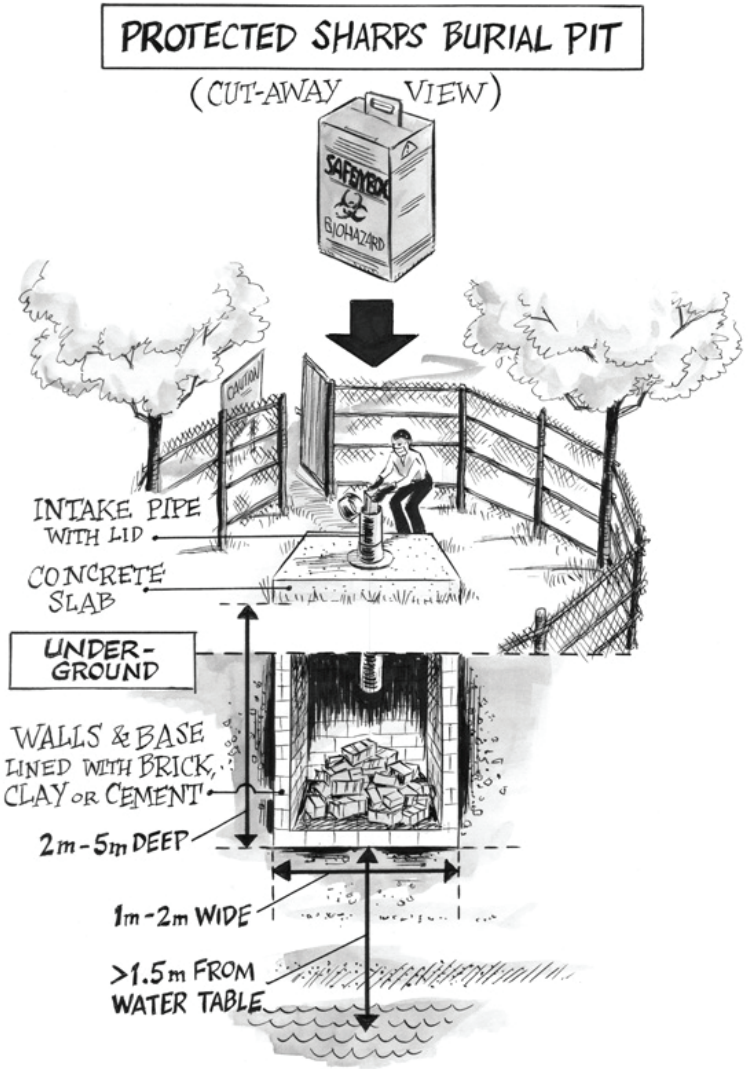


The *burn and bury* pit is a variation of the burial pit; ensure that it is placed downwind of the work and residential areas. Use fuel (straw or kerosene) to ignite the waste, then allow it to burn. Designated staff should supervise the fire. After the fire is out, cover the ash and remaining material with soil, as described above, to prepare for the next burn and bury. *Never* remove or move ash in a burn and bury pit.



***Protected sharps or ash pit (disposal method)***
A protected sharps or ash pit is a deep hole in the ground; the floor and sides are lined with clay, bricks, or cement; or it can be a hole constructed with cement pipes. Make sure the pit has a concrete cover with a narrow cylinder in such a way that you can drop a safety box or ash through the cylinder into the pit, but you can't reach inside. When the pit is full, fill it (encapsulate) with concrete or other immobilizing material (e.g., plastic foam, sand, cement, or clay) and seal it off. Keep the pit area fenced off and secured.

If you move ash from an incinerator, only move it to a protected ash pit. *Never* move ash from a burn and bury pit.



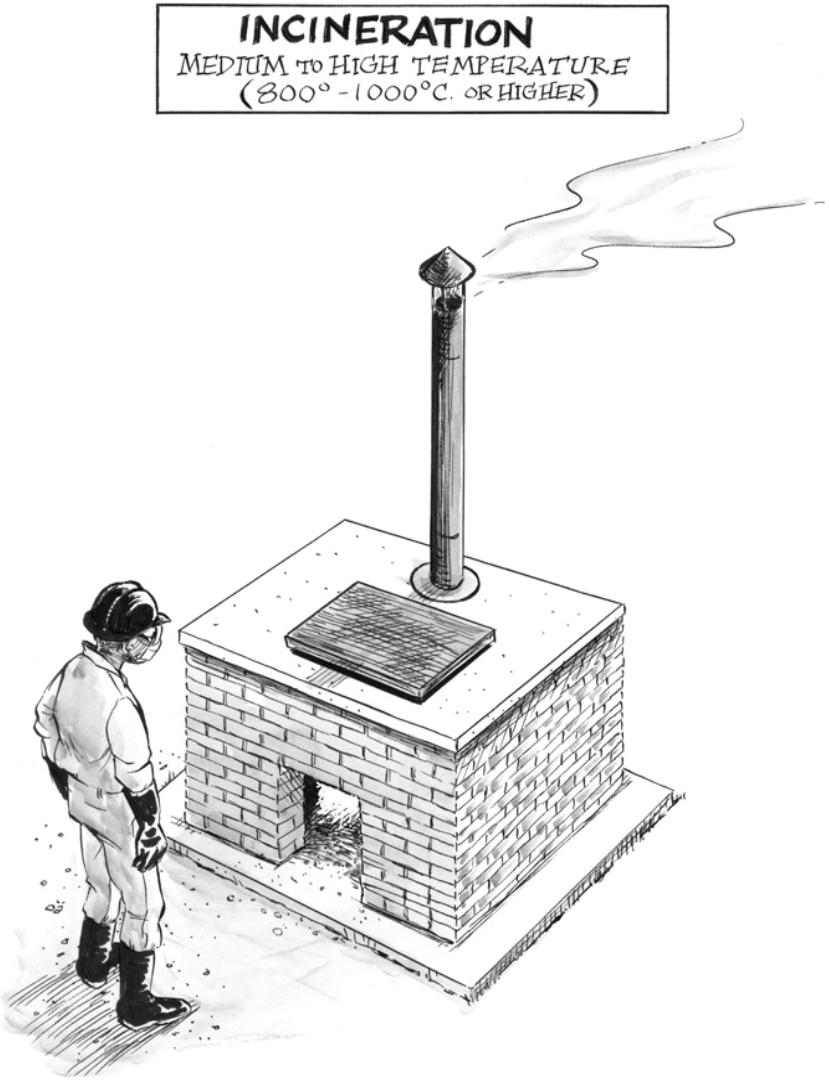
***Encapsulation (treatment and disposal method)***
To permanently encapsulate the sharps or pharmaceuticals, securely store them in large plastic containers or metal drums and add immobilizing material (e.g., plastic foam, sand, cement, or clay) to a container that is ¾ full. After the material is dry, seal and dispose of the container in a secured burial pit, or send it to municipal waste. A barrel used in this way is called a protected sharps barrel.

If using a lime, cement, and water mixture, use the proportions, by weight—15:15:5—respectively.

***Making pharmaceuticals inert (treatment method)***

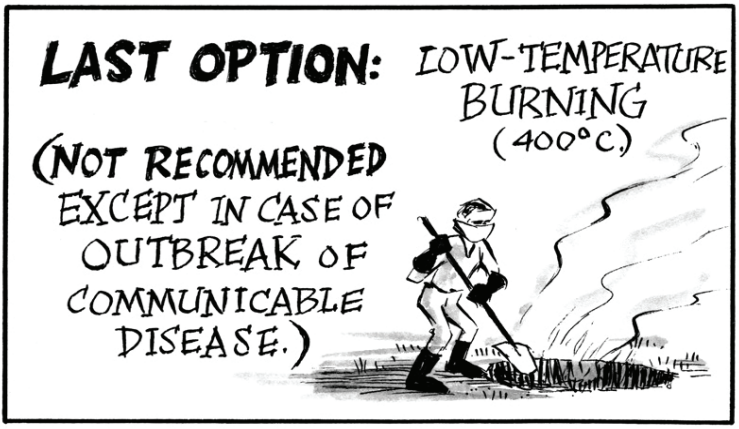
To prevent harm to people or the environment, pharmaceuticals are often made inert, which is similar to encapsulation. After removing the pharmaceuticals from their containers or blister packs, crush, then mix them with a lime, cement, and water mixture, using the following percentages, by weight: pharmaceutical 65%, lime 15%, cement 15%, and water 5%, or more, if needed. After the mixture hardens, dispose of it as general waste.

***Incineration—medium- to high-temperature burning (disposal method)***
You may not have this option available locally, but you may be able to return hazardous waste to an offsite facility that uses incineration (burning at 800–1,000°C or higher) to dispose of hazardous waste. Incinerating at a local cement kiln may be another good option, if available. A cement kiln can use small amounts of hazardous waste (5%) as fuel. These incinerators reach similar temperature ranges.



***Drum or pit burning—low-temperature burning***

To use this method, collect trash and put it in a barrel-shaped furnace or pit, and set it on fire. The combustible part of the trash will burn (<400°C), and the remainder will melt. Generally, low-temperature burning is not recommended for several reasons—sharps will not be destroyed and will remain a puncture risk; and plastics, pharmaceuticals and metals release toxic gases when they are burned, releasing contaminants into the air. Therefore, drum or pit burning should be the last option for infectious waste; only use it during an outbreak of communicable diseases. Never incinerate plastics or pharmaceuticals at low temperatures.



# Resources

## General resources

Eberle, Jim, Linda Allain, and Paula Nersesian. 2009. *Logistics of Health Care Waste Management: Information and Approaches for Developing Country Settings*. Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1.

Howard, Guy. 2002. *Healthy Villages: A Guide for Communities and Community Health Workers*. Geneva: World Health Organization.

Lehmann, Uta, and David Sanders. 2007. *Community health workers: What do we know about them? The state of the evidence on programmes, activities, costs and impact on health outcomes of using community health workers*. Geneva: World Health Organization.

Nersesian, Paula V., Vanessa Cesarz, Allison Cochran, Jennifer Mboyane, and Katie Schmidt. 2004. *Safe Injection and Waste Management: A Reference for Logistics Advisors*. Arlington, Va.: John Snow, Inc./DELIVER, for the U.S. Agency for International Development.

Ofosu-Amaah, V. 1983. *National experience in the use of community health workers. A review of current issues and problems*. WHO Offset Publ. 71:1–49.

PATH. 2005. *Training Health Workers in the Management of SHARPs Waste. Version 1*. Seattle: PATH.

World Health Organization (WHO). 2005a. *Management of Solid Health-Care Waste at Primary Health-Care Centers: A Decision-making Guide*. Geneva: WHO.

World Health Organization (WHO). 2005b. *Preparation of National Health-care waste management plans in sub-Saharan countries*. Geneva: WHO.

## Websites

http://www.healthcarewaste.org

http://www.who.int/injection_safety_/toolbox/en/AM_HCW_Safety_En.pdf

http://www.who.int/docstore/peh/archives/beh/behtgp1.pdf

https://wbln0018.worldbank.org/HDNet.HDdocs.nsf

## Malaria products

USAID | DELIVER PROJECT, Task Order 3. 2011. *Health Care Waste Management of Malaria Rapid Diagnostic Tests in Health Clinics*. Arlington, Va.: USAID | DELIVER PROJECT, Task Order 3.

World Health Organization-Western Pacific Regional Office (WHO-WPRO), USAID | DELIVER PROJECT, Foundation for Innovative New Diagnostics (FIND), Roll Back Malaria Partnership, President's Malaria Initiative (PMI), and UNICEF. July 2009. *Transporting, Storing, and Handling Malaria Rapid Diagnostic Tests in Health Clinics*. Arlington, Va.: USAID | DELIVER PROJECT, Task Order 3; and Manila: WHO-WPRO.

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## Management of spills and worker safety

Centers for Disease Control and Prevention (CDC). 2001. *U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis*. Updated. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5011a1.htm

World Health Organization (WHO). 2007. *Post-exposure prophylaxis to prevent HIV infection : joint WHO/ILO guidelines on post-exposure prophylaxis (PEP) to prevent HIV infection*. http://whqlibdoc.who.int/publications/2007/9789241596374_eng.pdf

## Pharmaceuticals

World Health Organization (WHO). 1999. *Guidelines for the Safe Disposal of Unwanted Pharmaceuticals in and after Emergencies Interagency Guidelines*. Geneva: WHO.http://www.who.int/water_sanitation_health/medicalwaste/unwantpharm.pdf

For more informstion please visit
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