

# **Waste disposal.**

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# Content

- I. Introduction
- II. Definition and segregation
- III. Waste disposal.
- IV. Waste storage.
- V. Waste transport.

Mission

Features

Faculty

About us

# Introduction

Purpose



# I. Introduction

- The emerging and re-emerging disease pose a major threat to the world population.
- There is no single country in the world who can deal with those emerging and re-emerging disease alone.
- In this context, the Mekong Basin Disease Surveillance (MBDS) network renewed and signed a Memorandum of Understanding (MoU) to enhance disease surveillance and response across the border in 2015.





Making Better Transitions  
Sustainable  
Development  
Goals





# I. Introduction

- The biosafety manual to enhance biosafety procedures at Points of Entry (POE) includes the topics as below:
  - Basic knowledge for Biosafety
  - Infection Prevention Control (IPC) of Health Care Facility in Cross Border
  - Waste disposal
  - Incident, accident preparedness and response
  - Role of national / sub national level Preparedness and Stockpile
  - Surveillance system for border region (WHO-DO- What-When)
  - Biosafety poster for Sub-National Health Care Personnel

# I. Introduction

- The biosafety manual to enhance biosafety procedures at Points of Entry (POE) includes the topics as below:
  - Basic knowledge for Biosafety
  - Infection Prevention Control (IPC) of Health Care Facility in Cross Border
  - **Waste disposal**
  - Incident, accident preparedness and response
  - Role of national / sub national level Preparedness and Stockpile
  - Surveillance system for border region (WHO-DO- What-When)
  - Biosafety poster for Sub-National Health Care Personnel

# DEFINITION

REDESIGN  
MARKETING RISK  
FUTURE  
SYSTEMS  
GOODS  
EFFECTIVE  
MAINTENANCE  
FACTORY  
CUSTOMER  
SERVICES  
STRATEGY  
EFFICIENT  
PLANNING  
ANALYSIS  
CONTR  
DEVELOPMENT  
DATA  
QUALITATIVE  
MODELING  
FUTURE  
OPERATION  
FUTURE

FUTURE  
DEFINITION  
MANAGERS  
DECISION  
INFORMATION  
STATISTICS  
DESIGN  
DEVELOPMENT  
QUALITATIVE  
DATA  
GOODS  
BUSINESS  
PLANNING  
STATISTICS  
GOODS  
MARKETING  
MANAGEMENT  
MODELING  
SERVICES  
FACTORY  
RISK



## II. Definition and segregation

**Infectious Waste** is the waste from patients with communicable disease, laboratory and microbiological investigations from all clinical and related laboratory services; and animal carcasses contaminated with pathogenic organisms.



## II. Definition and segregation

**Animal wastes** means a material composed of excreta, with or without bedding materials and/or animal drugs, collected from poultry or other animals except humans. It's also a waste of a biological nature, which has the potential to cause harm by acting as an infectious agent, while undergoing decomposition



## II. Definition and segregation

### **Pharmaceutical waste**

includes expired, unused, spilt and contaminated pharmaceutical products, prescribed and proprietary drugs, vaccines and sera that are no longer required, and, due to their chemical or biological nature, need to be disposed of carefully.



## II. Definition and segregation

**Sharp waste** is item that could cause cuts or puncture wounds, including needles, hypodermic needles, scalpels and other blades, knives, infusion sets, saws, broken glass and pipettes. They are usually considered highly hazardous health-care waste and should be treated as if they were potentially infected.





# II. Definition and segregation

**Chemical waste** consists of discarded solid, liquid and gaseous chemicals; for example, from diagnostic and experimental work and from cleaning and disinfecting procedures. It is considered to be hazardous if it has at least one of properties: toxic, corrosive, flammable, reactive, oxidizing.



## II. Definition and segregation

**Plastic wastes** from laboratories may be contaminated with other materials.

**Plastic wastes** contaminated with human pathogens, imported biologicals and genetically manipulated organisms must be autoclaved and incinerated.



## II. Definition and segregation

**Radioactive wastes** are materials contaminated with radionuclides. They are produced as a result of procedures such as in vitro analysis of body tissue and fluid, in vivo organ imaging and various investigative and therapeutic practices.





**WASTE DISPOSAL**

# III. Waste disposal

## Methods of disposal

### 1. Autoclaving

- Used for the treatment of infectious wastes.
- Problems may arise because of bulk and compaction of waste material; complete penetration of steam may be compromised and sterilization not achieved.
- Only special autoclave bags may be used. All bags must carry an indicator to show that waste has been subjected to adequate heat treatment.
- Autoclaves must be tested at least annually for adequate performance.

# III. Waste disposal

## Methods of disposal

### 1. Autoclaving



# III. Waste disposal

## Methods of disposal

### 2. Chemical disinfection

- Used for mopping up spills and for disinfectant baths for routine laboratory work.
- Sodium hypochlorite (5%) is used for potentially HIV contaminated equipment and disposables prior to autoclaving.
- A 0.5% of Sodium Hypochlorite solution is used for general laboratory clean up for hematological work not involving spills.

# III. Waste disposal

## Methods of disposal

### 2. Chemical disinfection

- 70% ethyl alcohol is used for standard clean up in microbiology laboratories.
- Hypochlorite solution should be rinsed off prior to autoclaving since dangerous gases may be generated when it is autoclaved.



# III. Waste disposal

## Methods of disposal

### 2. Chemical disinfection



# III. Waste disposal

## Methods of disposal

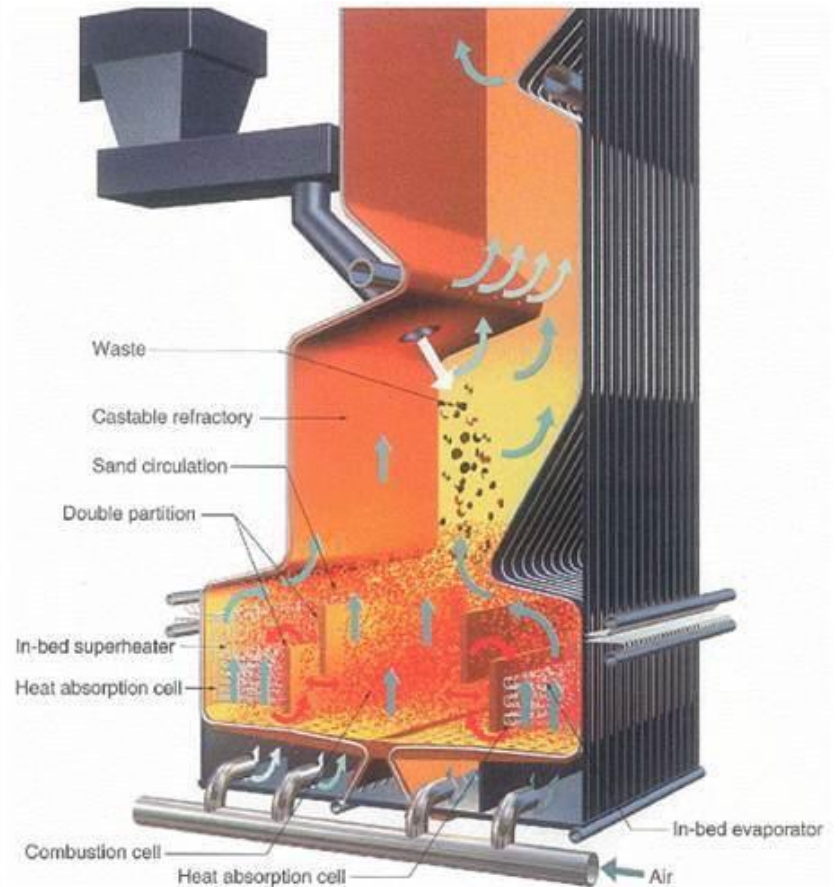
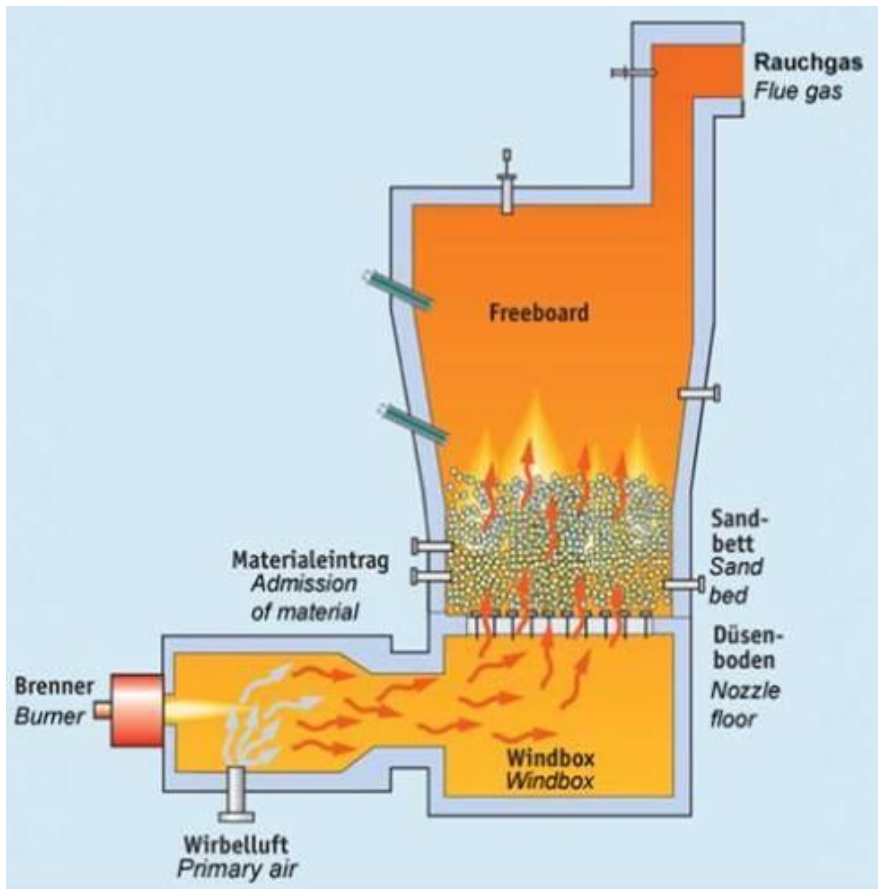
### 3. Incineration

- Burning in a multi-chambered, monitored facility. Any waste requiring high temperature incineration is collected by specialized agencies.
- Normal animal waste and carcasses are burned in the Animal House Incinerator. All plastics or other materials likely to produce toxic emissions must be collected by specialist agencies.
- Completely burned ashes are placed in sealed plastic bags and disposed of through normal rubbish collection.

# III. Waste disposal

## Methods of disposal

### 3. Incineration



# III. Waste disposal

## Methods of disposal

### 4. Sewerage and drain system disposal

- Wherever possible avoid discharging wastes into the sewerage and drain system.
- Very dilute non-toxic chemicals may be washed into the sewerage system.
- There are significantly justifiable limits for materials discharged into the sewerage and drain system.

# III. Waste disposal

## **Animal waste disposal**

- All animal house waste and carcasses of animals are to be incinerated within the confines of the animal house (C1 containment).
- Cages, water bottles, fittings and instruments must be autoclaved or disinfected according to requirements dictated by the organism involved before washing.
- No animal waste must leave the animal house. Thoroughly burnt ashes may be discarded through the municipal system.

# III. Waste disposal

## **Disposal of Pharmaceutical waste**

- Records must be kept of all pharmaceuticals destroyed.
- Pharmaceutical Waste must be placed in non-reactive containers and whenever possible incinerated.
- All pharmaceutical wastes are stored in appropriately labeled and constructed containers until collected by an appropriately licenced collection agency.

# III. Waste disposal

## Disposal of Pharmaceutical waste

### Pharmaceutical Waste Container Tip:

Work with a *knowledgeable* vendor to choose a *proper container for pharmaceutical disposal.*



# III. Waste disposal

## **Disposal of Pharmaceutical waste**

- Sharps must be placed in a rigid, impact resistant, puncture proof and sealable container of appropriate size and coloured yellow with the black biohazard symbol. Do not recap, bend, remove, or clip needles.
- Fill 3/4 full, snap the lid closed and secure with tape. Overfilling or forced filling may result in puncture wounds. Do Not Overfill.
- The disposal route for sharps is high temperature incineration.



# III. Waste disposal

## **Disposal of Pharmaceutical waste**

- The container must be appropriately labelled and stored as infectious waste or, where appropriate, cytotoxic waste.
- Avoid removing needles from syringes after use. If it is necessary to remove needles a "Needle Notcher" or equivalent must be used.
- Never attempt to recap needles.
- Never attempt to clip, bend or otherwise attempt to render needles or syringes unusable.

# III. Waste disposal

## Disposal of sharps

### KEEP YOUR COMMUNITY SAFE

**DO NOT  
throw loose  
sharps in trash**



**DO NOT  
put sharps  
in recycling**



**DO NOT  
flush sharps  
down toilet**

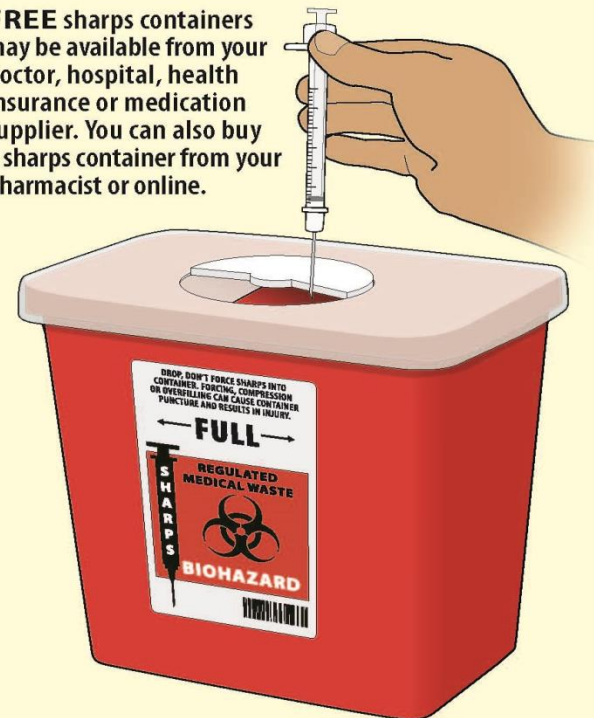


**KEEP OUT  
of reach  
of children**

### ALWAYS USE A SHARPS CONTAINER

Used sharps are hazardous waste. When not discarded properly they can cut and infect others. Protect your community by always discarding your used sharps in a sharps disposal container.

**FREE** sharps containers may be available from your doctor, hospital, health insurance or medication supplier. You can also buy a sharps container from your pharmacist or online.



For information about rules and laws in your community, contact the Coalition for Safe Community Needle Disposal at 800.643.1643. For more information on sharps visit [fda.gov/safesharpsdisposal](http://fda.gov/safesharpsdisposal).

### III. Waste disposal

#### **Disposal of non-sharp solid waste - autoclave**

- Collect non-sharp solid biological waste in autoclavable bags. It is preferable that autoclave bags be white or clear (not red or orange) and without the word "biohazardous" or the universal symbol for biohazardous material.
- Place filled bags into the autoclave pan for transport from the laboratory to the autoclave.
- Add 250 mL of water to the bag and close loosely to allow the steam to escape and air to enter.

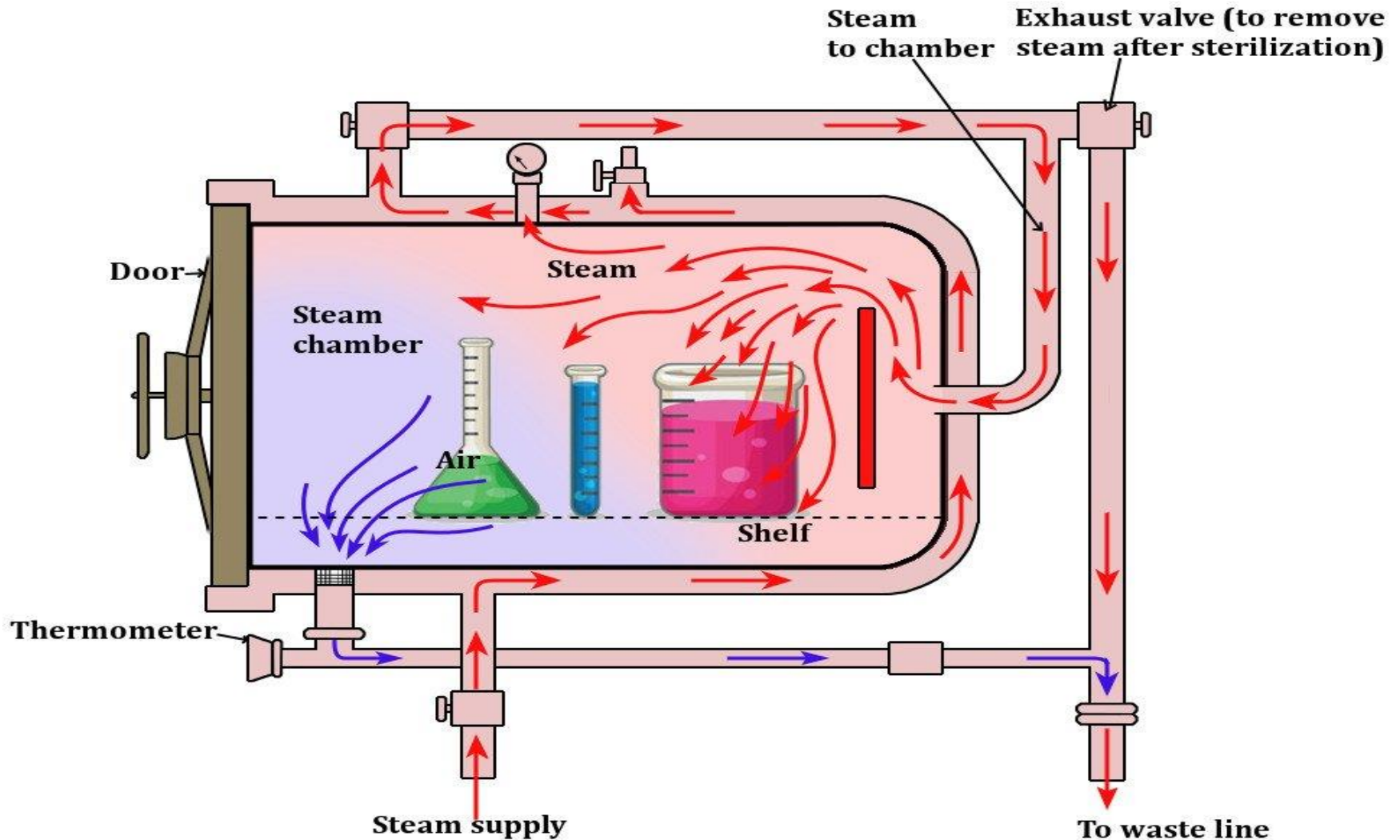
### III. Waste disposal

#### **Disposal of non-sharp solid waste - autoclave**

- Autoclave the pan and bag at 121°C for one hour.
- Allow the pan and autoclaved material to cool.
- Put autoclaved bags into trash cans lined with heavyweight, opaque plastic bags, and then transport them to the building dumpster.

# III. Waste disposal

## Disposal of non-sharp solid waste - autoclave



### III. Waste disposal

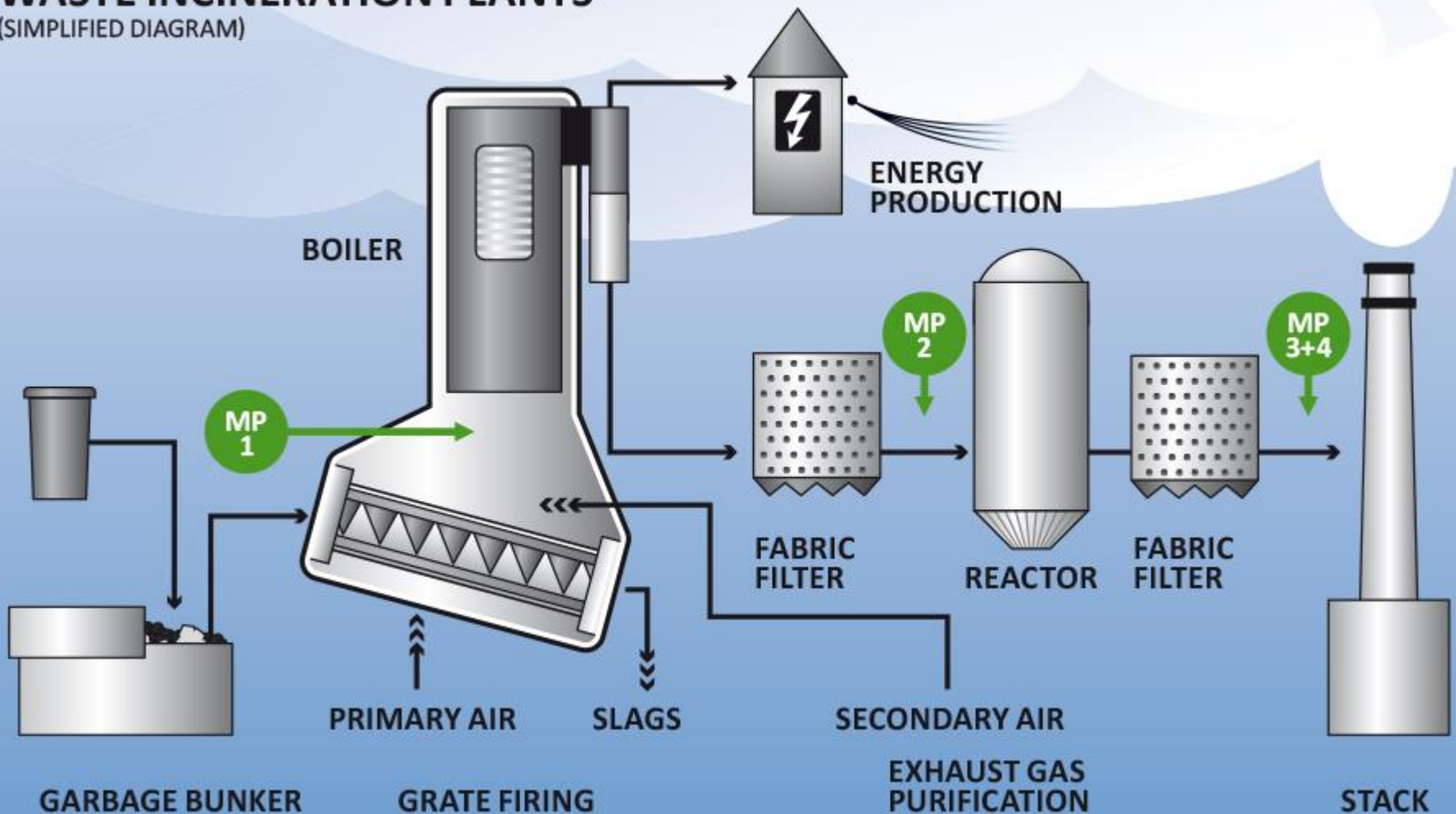
#### **Disposal of non-sharp solid waste-incineration**

- Place the waste material in a plastic liner inside a biohazardous waste box ("burn box"). Double bag wet material with absorbent material in the inner bag.
- Twist the plastic bag(s) at the top; bend the twisted portion to form a loop and seal with tape. Seal bags individually when double bagging.
- Secure the burn box with tape.

# III. Waste disposal

## Disposal of non-sharp solid waste-incineration

### WASTE INCINERATION PLANTS (SIMPLIFIED DIAGRAM)



### III. Waste disposal

#### **Disposal of contaminated glass and pasteur pipettes**

- Using 10% Hypochloride solution;
- Decontaminate the glass by autoclaving, or by soaking in 10% bleach for 30 minutes, then place in sturdy cardboard box, tape closed, and put the box in the building dumpster;
- Contaminated glass may be discarded into a sharps container and handled according to the instructions for "Sharps."



# III. Waste disposal

## **Disposal of Chemical wastes**

- Prepare the waste for disposal by storing it in an appropriate container.
- The container must be of sound and leak-tight condition and be appropriate to the type of waste to be disposed.
- No harmful quantity of chemical waste shall adhere to the outside of the container.

# III. Waste disposal

## **Disposal of Chemical wastes**

- Chemical waste must not be accumulated for disposal.
- Regular disposal must be arranged.
- Chemical waste must be stored in an appropriate manner so as not to create a hazard to laboratory- staff.
- Chemical waste must not be mixed with other chemical wastes for the purpose of accumulation unless the waste is of the same type.

# III. Waste disposal

## **Disposal of Chemical wastes**

- Personal Protective Equipment should be a consideration when handling chemical waste. Reference should be made to the Material Safety Data Sheet.
- Further information on chemicals can be obtained from the manufacturer, supplier.

# III. Waste disposal

## Precaution in waste disposal

- All generators of potentially hazardous wastes must ensure the accurate and complete labelling and safe storage, transport, treatment and disposal of such wastes.
- Wastes should be minimized where possible.
- Wastes should be segregated at the outset and mixing avoided where possible.
- Untrained staff and students are not to handle hazardous wastes and must not be given responsibility for them.

# III. Waste disposal

## **Precaution in waste disposal**

- Gloves must be worn at all times when handling infectious waste and disposed of as infectious waste. Infectious waste should not be stored for long periods in the generating area.
- Storage should be under refrigeration in a locked room which is clearly identified and labelled "Infectious Waste" and carry the internationally recognized "Biohazard" symbol.

# III. Waste disposal

## Precaution in waste disposal

- Infectious waste should be double-bagged in yellow plastic bags carrying the Biohazard symbol. It must never be compacted or mulched.
- Waste from infectious organisms, infected materials, imported organisms and genetically manipulated microorganisms are to be autoclaved and incinerated.
- All animal carcasses contaminated by such microorganisms are to be incinerated within the confines of the animal house.

A dark red folder icon with a tab on top. The word "STORAGE" is written in white, bold, capital letters across the center of the folder.

STORAGE

## IV. Waste storage

- All storage facilities must be adequate, suitably sited, safe and hygienic;
- Unqualified personnel are not to have access to waste storage;
- Waste must not be compacted under any circumstances;
- Categories of waste must be identified and separated before storage;
- Waste must not be allowed to accumulate excessively and must be collected as frequently as possible.



# IV. Waste storage

## WHO recommended Color code

Type of waste	Colour of container and markings <sup>a</sup>	Type of container
Highly infectious waste	Yellow, marked "HIGHLY INFECTIOUS", with biohazard symbol	Strong, leak-proof plastic bag, or container capable of being autoclaved
Other infectious waste, pathological and anatomical waste	Yellow with biohazard symbol	Leak-proof plastic bag or container
Sharps	Yellow, marked "SHARPS", with biohazard symbol	Puncture-proof container
Chemical and pharmaceutical waste	Brown, labelled with appropriate hazard symbol	Plastic bag or rigid container
Radioactive waste <sup>b</sup>	Labelled with radiation symbol	Lead box
General health-care waste	Black	Plastic bag

# IV. Waste storage

## CPCB recommended Color code

COLOUR	WASTE DESCRIPTION
<b>YELLOW*</b>	Human tissues, organs, body parts, items contaminated by blood/body fluids, soiled cotton & dressing, soiled plaster casts etc.
<b>RED*</b>	Catheters, tubes, cannulae, syringes, plastic IV bottles & sets, used gloves, infected plastics, specimen containers, lab waste, microbiology cultures, used or discarded bags of blood/blood products, vaccines etc.
<b>BLUE*</b>	Glass items, needles, syringes, scalpels, blades, used and unused sharps etc.
<b>BLACK*</b>	Discarded medicines, discarded cytotoxic drugs etc.
<b>GREEN</b>	General waste, non-infected plastic materials & papers, disposables, cardboards, metal containers, office waste, food waste etc.

# IV. Waste storage

## PHS recommended Color code





Transport

## V. Waste transport

### **General principle**

- Waste transportation trolleys for general waste should be painted black, only be used for non-hazardous waste types and labelled clearly “General waste” or “Non-hazardous waste”.
- Infectious waste can be transported together with used sharps waste. Infectious waste should not be transported together with other hazardous waste, to prevent the possible spread of infectious agents.

## V. Waste transport

### **General principle**

- Waste transportation trolleys for general waste should be painted black, only be used for non-hazardous waste types and labelled clearly “General waste” or “Non-hazardous waste”.
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## V. Waste transport

### **Internal**

Transport of wastes to collection/storage areas.

- All wastes must be fully labeled and secured (closed) within appropriately designed and constructed containers in the lab or other point of generation prior to transport to the autoclave or other destination and must remain closed at all times during transport.
- All containers must be packed to minimize the risk of breakage or rupture.

## V. Waste transport

### **Internal**

Transport of wastes to collection/storage areas.

- If transport is by vehicle, the secondary container must be leak-proof with a tight sealing lid that remains closed during transport, spill kits and appropriately trained staff must accompany wastes.
- Wastes must never be left unattended whilst waiting for collection by external agencies.



## V. Waste transport

### **External**

Any vehicle used to transport health-care waste should fulfill several design criteria:

- The body of the vehicle should be of a suitable size commensurate with the design of the vehicle.
- There should be a bulkhead between the driver's cabin and the vehicle body, which is designed to retain the load if the vehicle is involved in a collision.
- There should be a suitable system for securing the load during transport.

## V. Waste transport

### **External**

Any vehicle used to transport health-care waste should fulfill several design criteria:

- Empty plastic bags, suitable protective clothing, cleaning equipment, tools and disinfectant, together with special kits for dealing with liquid spills, should be carried in a separate compartment in the vehicle.
- The internal finish of the vehicle should allow it to be steam-cleaned and internal angles should be rounded to eliminate sharp edges to permit more thorough cleaning and prevent damage to waste containers.

## V. Waste transport

### **External**

Any vehicle used to transport health-care waste should fulfill several design criteria:

- The vehicle should be marked with the name and address of the waste carrier.
- An international hazard sign should be displayed on the vehicle and containers, as well as an emergency telephone number.
- The driver should be provided with details of the waste being carried.

## V. Waste transport

### **External**

The most important thing:

**All waste is collected by accredited waste collection agencies.**

Thank You!

