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GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

GLOBAL HEALTHCARE WASTE PROJECT

Module 10: Segregation of Healthcare Waste



Module Overview

- Review waste classifications
- Describe why waste segregation is important
- Describe color-coding and waste containers
- Demonstrate segregation of healthcare waste

Learning Objectives

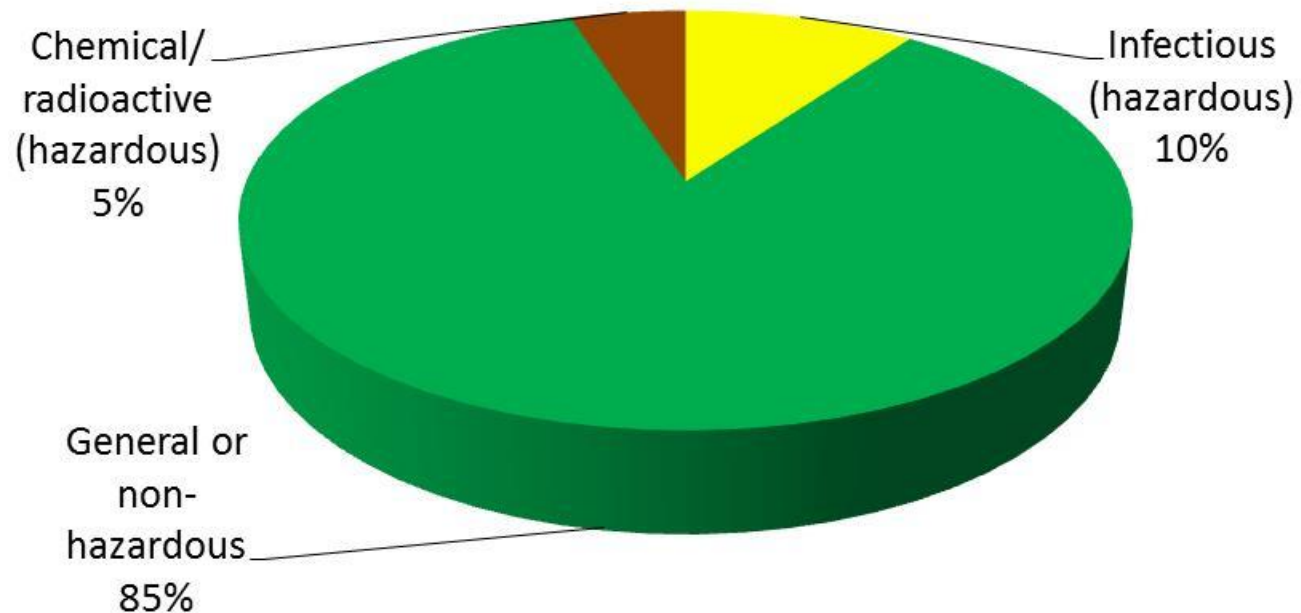
- Explain why segregation is important
- Demonstrate segregation of healthcare waste
- Discuss acceptable options for commercial color-coded bags and sharps containers
- Create informational posters and signs specific to waste segregation

Steps in Healthcare Waste Management

- Waste classification
- **Waste segregation**
- Waste minimization
- Handling and collection
- On-site transport and storage
- Treatment and disposal

General Principles

- When properly segregated, 85% or more of healthcare wastes are general waste with the same risk as domestic solid waste.
- Typical breakdown of healthcare waste:



Why Segregate Healthcare Waste?

- To reduce the amount of waste that must be treated as hazardous waste
- To reduce the risks of exposure to hazardous healthcare waste for workers
- To lower the cost of treatment and disposal of healthcare waste
- To make possible the recycling of non-hazardous general waste



Country-specific Waste Segregation Requirements

***INSERT SLIDES
SHOWING DEFINITIONS
AND EXAMPLES of current
color coding required in
your country***

Review of Waste Classifications

World Health Organization Classifications

Biological (infectious) risks

Sharps Waste	Infectious Waste	Pathological Waste
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Chemical risks

Pharmaceutical Waste	Chemical Waste	Radioactive Waste
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Low risk

Non-Hazardous General Waste

Needles	Waste contaminated with blood	Body parts
Blades		Human tissue
Broken glass	Cultures	Animal carcasses
	Isolation waste	

Expired drugs	Chemical solvents	Radio-nuclides
Expired vaccines	Mercury	Vials with radioactive residues
Cytotoxic waste	Cleaners	
	Batteries	

Recyclable and compostable waste
Non-recyclable waste

Waste Segregation

Separation of different classifications of healthcare waste from each other beginning at the point of generation, and maintaining the separation during storage and transport, until treatment

WHO-Recommended Segregation Scheme

Type of waste	Color of container and markings	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	Labelled with radiation symbol	Lead box
General healthcare waste	Black	Plastic bag

Example of a More Complex Segregation Scheme

Waste Classification	Color-Coding, Marking, and Container
Sharps	Yellow, “SHARPS”, puncture-proof container
Infectious waste	Yellow, biohazard symbol, leak-proof plastic bag
Pathological waste	Red, biohazard symbol, leak-proof plastic bag \geq 50 micron thickness
Pharmaceutical and cytotoxic waste	Brown, “PHARMACEUTICAL WASTE” or “CYTOTOXIC WASTE”, leak-proof bag or container
Chemical waste	Brown, hazardous waste label, hazard symbol depending on hazard class, approved hazardous waste container
Mercury waste	Brown, “MERCURY WASTE”, toxic symbol, air-tight double container
Radioactive waste	Orange, radioactive symbol, sealable fiber drum or plastic pail
Biodegradable general waste	Green, plastic bag
Non-degradable general waste	Transparent plastic bag

Minimum Level of Segregation Recommended by WHO

Type of Waste	Color, Type of Container
Sharps	Sharps container
Infectious waste	Yellow or red bags
General waste	Black or transparent bags

Specifications and Alternatives for Low-Resource Settings

TYPE OF WASTE	SPECIFICATIONS FOR CONTAINER OR BAG	INTERIM ALTERNATIVES
Sharps	<ul style="list-style-type: none"> - Container should be puncture-resistant, leak-proof on the sides and bottom, and durable. It should have the biohazard label. It should be closable if used to transport sharps waste. 	<ul style="list-style-type: none"> - Empty bleach bottle with a biohazard label - Thick rigid puncture-resistant cardboard box with a biohazard label - Rigid plastic container with a biohazard label
Non-sharps infectious solid and semi-liquid waste	<ul style="list-style-type: none"> - Yellow plastic bag should be leak-proof; designed to prevent ripping, tearing, or bursting under normal use. The plastic bag should be placed inside a rigid container during filling. - Yellow rigid container should be leak-proof, durable, labeled with the biohazard symbol, and color-coded. 	<ul style="list-style-type: none"> - Any available color plastic bag placed in a yellow painted metal or plastic garbage bin with the biohazard label. - Plastic bag placed inside a hard cardboard box with the biohazard label and markings.
Non-sharps infectious liquid waste	<ul style="list-style-type: none"> - Container should be leak-proof and durable. It should be marked with the biohazard label if it will be used to transport the waste and it should be designed such that it can be transported without spillage. 	<ul style="list-style-type: none"> - Bottles, plastic containers, canisters, or pails with covers. Check for leaking before use.

Sharps Containers



Cardboard safety box for low resource settings



Autoclavable metal sharps container



Hard plastic bottle if a sharps container is not available

Containers for Waste Collection

- Containers for collection of infectious waste have to be leak-proof plastic or metal containers, colored according to the country's color coding, and marked with the biohazard symbol



Color Coding for Bags and Containers

- The same color code must be maintained during all stages of waste management until final disposal
- This helps with:
 - preventing tampering of waste by unauthorized persons
 - easy identification of waste
 - preventing accidental mixing of waste

Bags for Waste Collection

- The hard containers holding the plastic bags should be of the same color as the bags except if a bag holder frame is used.
- The plastic bag and bin should have the 'biohazard' symbol prominently displayed.
- Cautionary markings on the outside of the bag written in the local language are recommended.



Bags for Waste Collection

- The hard containers holding the plastic bags should be of the same color as the bags except if a bag holder frame is used.
- The plastic bag and bin should have the 'biohazard' symbol prominently displayed.
- Cautionary markings on the outside of the bag written in the local language are recommended.



Safety Boxes

The following should be disposed of in a safety box:



- Syringes and needles
- Syringes with needles removed (if using a needle remover)
- Needles with infusion set removed
- Scalpels
- Blades
- Broken glass (e.g., pipettes, ampoules, broken vials)

Image
courtesy of
WHO.int

Class Discussion: What Goes Where?

	Red bag	Sharps container	Black bag
Blood-saturated gauze			
Empty IV bag			
Used hypodermic needle			
Suction canister with body fluids			
Cotton with a little dried blood			
IV tube containing fluid blood			
Thermometer			
Dirty glove			
Soiled disposable diaper			

Class Discussion: What Goes Where?

	Red bag	Sharps container	Black bag
Expired medicines			
Broken pipette			
Patient's empty juice bottle			
Lancet			
Lesion removed from a patient			
Culture dish			
Cotton swab with a little alcohol			
Blood-covered surgical gown			
Disposable tongue depressor used with a patient			

Class Discussion: What Goes Where?

Lollipop
stick from a
sick child



Spoon used
by a sick
child



Tongue
depressor
used on a sick
child



Where Do You Place Bins?

- Infectious waste containers should not be placed in areas where no infectious waste is generated (such as visitors' waiting areas, visitors' toilets, reception, medical records department, administrative offices, etc.)
- In areas where both infectious and non-infectious wastes are generated, both containers should be strategically placed near each other so as to facilitate segregation.
- Sharps containers should be within arm's length of the health professionals giving the injections. Having waste containers too far away can lead to needle-stick injuries.
- Too many infectious waste containers placed in the wrong locations tend to inflate infectious waste volumes and undermine segregation.
- Too few infectious waste containers where infectious wastes are generated leads to discarding of infectious wastes with regular waste, thereby undermining segregation.

Where Do You Place Bins?

- Infectious and sharps bins should not generally be placed by the patient beds except for isolation wards.
- The nurse's trolley should have the infectious waste container (for contaminated swabs or dressings), a non-infectious waste container (for clean packaging and regular waste) and a sharps container to be available within arms length.
- Infectious and non-infectious waste containers should be in the nurses' station, treatment room, or in other areas that patients and visitors cannot access.
- If the facility recycles non-hazardous general waste, marked containers for recyclables such as paper, packaging, plastic bottles and aluminum cans should be strategically located.
- If they are used, hub cutters should also be on the treatment trolley so the nurse can dispose used syringes immediately.
- Chemical waste containers should be in areas where chemical waste is generated, such as pharmacy, laboratory and engineering.

Which Bins Would You Place In...?

	Sharps container	Infectious waste container	Non-infectious waste container	Chemical waste container
Treatment room				
Visitors waiting room				
Physical therapy				
Bedside in the patient ward				
Nurses station of the patient ward				
Reception/registration area				
Surgical theater				
Emergency department				

Which Bins Would You Place In...?

	Sharps container	Infectious waste container	Non-infectious waste container	Chemical waste container
Facility maintenance or engineering				
Pharmacy				
Dental clinic				
Radiology				
Medical records				
Maternity				
Biomedical laboratory				

Problems of Segregation

- A lot of waste that is segregated as “infectious” may be clean
- Sterile packaging, uncontaminated gloves and masks, and other clean waste should be treated as general waste

WHAT IS WRONG WITH THIS PICTURE?



Problems of Segregation

- Sharps waste should not be discarded in non-sharps containers
- Infectious waste should not be discarded with general waste

WHAT IS WRONG WITH THIS PICTURE?



What is Wrong With This Picture?



This photo was taken in a country with the following color code:
Yellow = infectious waste; Black = discarded medicines, cytotoxic and chemical waste

What is Wrong With This Picture?



This photo was taken in a country with the following color code:

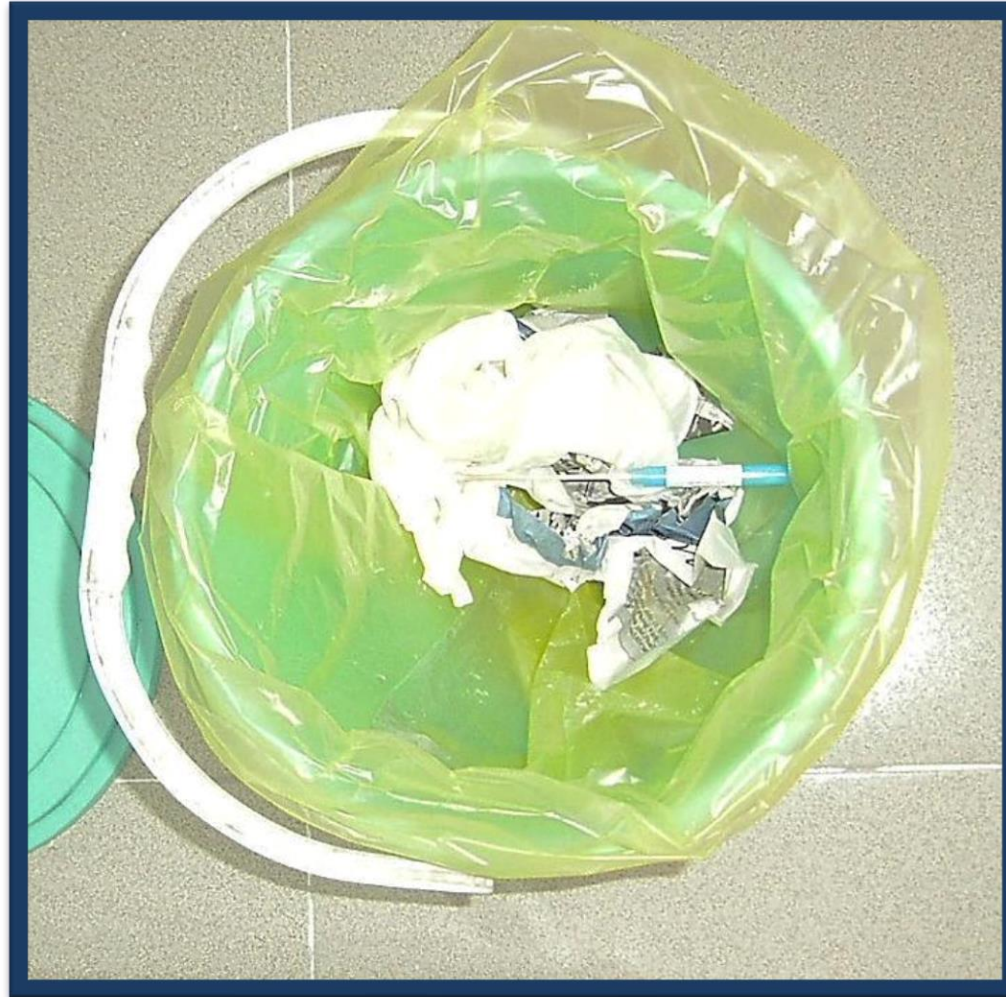
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What is Wrong With This Picture?



This photo was taken in a country with the following color code:
Yellow = infectious waste

What is Wrong With This Picture?



This photo was taken in a country with the following color code:
Yellow = infectious waste

Problem of Overfilling and Mixing Colors

WHAT IS WRONG WITH THIS PICTURE?



This photo was taken in a country with the following color code:
Red = infectious waste, Black = general waste

What is Wrong With This Picture?

Problems of Segregation

- Chemical waste containing heavy metals such as mercury and cadmium should be segregated and treated as hazardous.
 - What should you do with a broken thermometer?
 - What do you do with batteries and fluorescent lamps?

WHAT IS WRONG WITH THIS PICTURE?



Dealing With Segregation Errors

- Staff should never attempt to correct errors of segregation by removing items from a bag or container after disposal or by placing one bag inside another bag of a different color
- If general and hazardous wastes are accidentally mixed, the mixture should be treated as hazardous healthcare waste

Sample of an Educational Segregation Poster

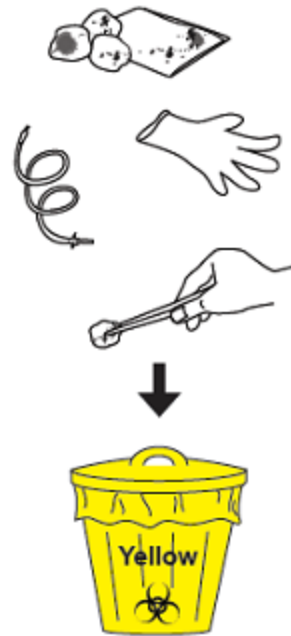
Non-Infectious Waste

- Paper/Packaging material
- Bottles/Cans
- Food



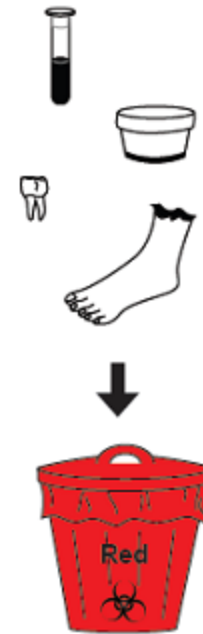
Infectious Waste

- Gauze/Dressing
- Blood/IV giving sets
- Gloves
- Pharmaceutical waste



Highly Infectious Waste

- Anatomical waste
- Teeth
 - Placenta
- Pathological waste
- Sputum container
 - Test tubes containing specimens



Sharps Waste

- Infusion needles
- Broken slides
- Broken vial
- Broken ampules
- Lancet
- Retractables
- Scalpels
- Blades
- Needles



Sample of an Educational Segregation Poster

Dans chaque salle de soins, toujours disposer de trois types de contenants pour les trois types de déchets

1



Un contenant exclusif pour DASRI mouss

Trier et conditionner les DASRI mouss dans le contenant adapté

2



Un contenant exclusif pour objets piquants coupants et tranchants (OPCT)

Trier et conditionner les OPCT dans le contenant adapté

3



Un contenant exclusif pour Déchets assimilables aux ordures ménagères (DAOM)

Trier et conditionner les DAOM dans le contenant adapté



PRONALIN – MSHP – TEL +221338694300 – FAX +221338694205 – www.sante.gouv.sn – Email: pronalinseneegal@yahoo.fr

Sample of an Educational Segregation Poster

SACOS UTILIZADOS		
COLETA DE RESÍDUO	COR DO SACO	SIMBOLOGIA
Saco para Resíduo Infectante	Saco Branco	 INFECTANTE
Saco para Resíduo Químico Perigoso	Saco Abóbora	 QUÍMICO PERIGOSO
Saco para Resíduo Radioterápico	Saco Lilás	 RADIOATIVO
Saco para Resíduo Comum	Saco Preto	Não Tem

COLETA DE ROUPA SUJA	COR DO SACO	IDENTIFICAÇÃO
Saco para roupa comum sem Matéria Orgânica	SACO AZUL	Não esquecer de identificar cada saco com o n° do apto.
Saco para roupa muito suja com Matéria Orgânica	SACO AMARELO	Não esquecer de identificar cada saco com o n° do apto.
Saco para roupa de todos os isolamentos	SACO AMARELO	Não esquecer de identificar cada saco com o n° do apto.

CCIH e Higiene Hospitalar

Sample of an Educational Segregation Poster

SEGREGATE MEDICAL WASTE



BLACK BIN

Paper & Plastic Packaging
Kitchen waste
Fruits

GENERAL WASTE



BLUE BIN

Infectious waste
Syringes, Gloves
Dressings

NON-SHARPS



INFECTIOUS WASTE



RED/YELLOW

Placenta
Anatomical &
Pathological
Waste

**ANATOMICAL
WASTE**



WHITE BIN

Cut Glass
Scalpels
Needles
Blades

SHARPS

SS Medical Systems (I) Pvt. Ltd.
India's only CE & EN/ISO 13485 Certified Biomedical Waste Management Company Cell. : 9452010000 www.ssmediworld.com

Sample of an Educational Segregation Poster

Limbah pelayanan kesehatan yang saya hasilkan adalah mengandung materi infeksius. Jangan bahayakan orang lain. Buanglah pada tempatnya sesuai dengan jenisnya!



Limbah nyeng uloen hasekan watee peubat ureung saket meungandung virus infeksi. Magat bek mudharat ureung laen. Boeh keuh broeh bak teuempat jih.

Al-Furqan:1
 وَالَّذِينَ إِذَا أَنْفَقُوا لَمْ يُسْرِفُوا وَلَمْ يَقْتُرُوا وَكَانَ بَيْنَ ذَلِكَ قَوَامًا
 Dan orang-orang yang apabila membelanjakan (harta), mereka tidak berlebihan, dan tidak (pula) miskin, dan adalah (pendaftaran) itu di tengah-tengah antara yang demikian.

(Ulu Husein)
**Iman itu terdiri dari 23 cabang, yang paling rendah adalah :
 menyingkiran (benda yang menyebabkan celaka dari jalan dan yang paling tinggi adalah ucapan la laka Halilah)**



Sample poster for wards

Mau hidup sehat? Mau beribadah? Buanglah sampah pada tempatnya!



Keumeung udeep sehat? Keumeung beribadah? Boeh keuh broeh bak teumpat jih! Gleh nyan nyokeuh sebahagian dari iman

Al-Ayatul
 وَأَذْكُرُوا إِذْ جَعَلَكُمْ خُلَفَاءَ مِنْ بَعْدِ عَادٍ وَبَوَّأَكُمْ فِي الْأَرْضِ تَتَّخِذُونَ مِنْ سَهُولِهَا مَقُورًا وَتَنْحَنُونَ الْجِبَالَ بَيْوتًا فَاتَّكُرُوا آلَاءَ اللَّهِ وَلَا تَعْتَدُوا فِي الْأَرْضِ مُفْسِدِينَ
 ... maka ingatlah nikmat-nikmat Allah dan jurgalah kamu merajalela di muka bumi membuat kerusakan"



Sample poster for public area

Example of a Segregation Poster for Infectious Waste Placed Above a Yellow Container



Example of Segregation Posters Placed Above Corresponding Bins for Infectious, General and Recyclable Wastes



Example of Segregation Posters Placed Above Corresponding Bins for Infectious, General and Recyclable Wastes



Example of Segregation Bins for Regular Waste



From left to right: non-recyclable waste; recyclable plastic, paper, glass and metal

(Additional Slide for Country-Specific Segregation Posters)

Discussion

- Do you have sufficient resources (color-coded bags, bins, containers)?
- How can you improvise if you do not have resources?
- Do you monitor the segregation of your wastes?
- Do you have a plan for placement of colored bins?
- What works in your setting to improve segregation?
What does not work?
- Does your facility recycle? How can you initiate or improve recycling?