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GLOBAL HEALTHCARE WASTE PROJECT

INSTRUCTOR GUIDE

MODULE 13: ON-SITE TRANSPORT AND STORAGE OF HEALTHCARE WASTES

World Health Organization

Health Care Without Harm

UIC UNIVERSITY OF ILLINOIS AT CHICAGO SCHOOL OF PUBLIC HEALTH
Environmental and Occupational Health Sciences Division

MODULE 13: ON-SITE TRANSPORT AND STORAGE OF HEALTHCARE WASTES

Estimated Time	• Lecture: 1 hour • Activity: 1 hour
Module Overview	• Present the basic principles of waste transport • Present equipment specifications and describe appropriate equipment for waste transport • Describe routing plans • Describe specifications for storage areas • Describe the requirements for storage of different kinds of wastes
Learning Objectives	• Define the essential elements of on-site transport equipment • Evaluate and improve on transport equipment designs • Explain the basic requirements for central storage • Develop a plan for safe routing of different kinds of waste • Write procedures for cleaning and disinfection of on-site transport equipment
Target Audience	• HCWM coordinators • Healthcare waste workers (Note: Presentation slides should be adjusted to fit the needs of waste workers.) • Healthcare professionals
Instructor Preparation	• Make notes pages of PowerPoint slides to hand out to class • Make copies of class exercise and homework for distribution after PowerPoint presentation • Read Chapter 7 in Blue Book, and other materials included in the References • Make copies of any additional documents/readings that may be handed out to class, such as those included in the References • Facility/ward specific floor plans • Prepare any additional notes to be discussed during the presentation • Prepare any additional discussion points or review questions

Materials Needed	• Projector • Student handouts: slides, exercise, homework • Flip chart and marker pens and/or board and chalk • Facility or ward specific floor plans for the exercise.
Student Preparation	• Blue Book Chapter 7 • Think about on-site transport and storage processes in your healthcare facility
Review Questions	• How does your facility store and transport wastes? Are there written guidelines for properly storing and transporting the wastes? Are different types of wastes kept separate during transport and storage? What are some alternative methods for dealing with these wastes that may or may not be practiced in your facility? Are safety procedures or practices in place to ensure that staff members and the public are not exposed during the processes? • Do you know about your country's or region's regulations regarding waste transport and storage? • What are the advantages and disadvantages of different healthcare waste transport systems? Do some seem to be safer and more effective than others? What about storage procedures? • How does the storage setup in your facility compare with some of the general requirements given in this presentation?

PRESENTATION

Slide Number/Title	Teacher's Notes
Slide 1: Title Slide	
Slide 2: Module Overview	Introduce the outline and major points of the presentation
Slide 3: Learning Objectives	Describe what participants will learn at the end of this module.
Slide 4: Steps in Healthcare Waste Management	This module focuses on transport and storage inside the healthcare facility.
Slide 5: Types of Waste Transport	Describe the two types of waste transport: internal transport and external transport
Slide 6: General Principles of On-Site Transport	On-site transport of wastes should take place during low activity times and specific routes should be planned so as to avoid public passageways and unnecessary exposure to patients/staff. Regular transport routes and collection times should be fixed and reliable.
Slide 7: Example of a Healthcare Facility Site Plan Showing Collection Points	In the site plan, the green dots refer to regular waste container, the red dots are infectious waste containers, yellow boxes with red borders are sharps containers, and brown dots are chemical waste containers.
Slide 8: General Principles of On-Site Transport	Regular transport routes and collection times should be fixed and reliable. Transport staff should have adequate PPE. There should also be secure storage rooms on site to keep hazardous wastes separate from general wastes.
Slide 9: On-site Transport Equipment	Go over the essential elements of on-site transport equipment and proper use of the equipment. Spare transportation equipment should be available in case of break downs and maintenance.
Slide 10: On-site Transport Equipment	It is important that the segregation of waste is maintained during transport. Go over some ideas for how this can be accomplished.

Slide 11: Waste Transport	
Slide 12: Waste Transport	Note: this is a slide that also appears in Module 12 Having your body in the right position helps protect your back and allows you to use your body in a safe way. Injury to the spine may cause problems such as a loss of feeling, movement, and strength, and could also lead to loss of body functions. When lifting an object: Test the weight. Get in a stable position by having your feet apart in a standing position. Your back should be kept straight. Lower your body to get close to the object by bending from your hips and knees. DO NOT bend at the waist. Keeping your knees bent and your back straight, lift the object using your arm and leg muscles. Do not use your back muscles. Tighten your stomach muscles when lifting. Do not bend and twist your body at the same time. When turning, rotate your whole body, not just your back. Repeat the same movements when setting the object down. For heavy objects, use wheeled carts, safety belts and other equipment to help you move the object or ask another person to help you. Source of image: http://www.vcu.edu/oehs/fire/safetytech.html
Slide 13: Equipment Specifications	Go through some basic equipment specifications for trolleys and carts As you go through the next series of slides, examine the photos of each piece of transport equipment and discuss the strengths and weaknesses of each system with the class. Spare transportation equipment should be available in case of break downs and maintenance.

Slide 14: Typical Infectious Waste Trolley	
Slide 15: Typical General Waste Trolley	
Slide 16: Example of an Infectious Waste Trolley	
Slide 17: Example of an Infectious Waste Trolley	
Slide 18: Examples of Wheeled Bins to Transport Larger Amounts of Infectious Waste	
Slide 19: Example of a Wheeled Bin to Transport Larger Amounts of Infectious Waste	
Slide 20: Push-carts for Low-Resource Settings	Castors (or casters) are wheels of a particular design to be attached to a larger object. The trolley should be leak-proof and covered. Ideally made of robustly constructed stainless steel, with good, durable castors
Slide 21: Example of a Push-cart	
Slide 22: Push-carts for Low-Resource Settings	
Slide 23: Example of a Wheeled Bin for Chemical Waste	
Slide 24: Cleaning Transport Equipment	Vehicles should be cleaned and disinfected daily with an appropriate disinfectant. Procedures should be clearly written for the cleaning and disinfection of on-site transport equipment.
Slide 25: Example of a Cart Cleaning Station	Photo from the UNDP GEF Project in Argentina

Slide 26: Routing	Waste collection should be started from the cleanest, most hygienically sensitive areas within the facility, and then proceed through to the dirtiest areas. Routes for hazardous and non-hazardous wastes should be planned separately.
Slide 27: Routing Plan	Go through the five listed points upon which the routing plan will depend.
Slide 28: On-site/Interim Storage	
Slide 29: On-site/Central Storage	Central storage is the place within the healthcare facility where waste should be brought for safe retention until it is treated or collected for transport off-site.
Slide 30: General Requirements for Storage Areas	Go through the list of general requirements for storage areas
Slide 31: General Requirements for Central Storage Areas	Go through the list of general requirements for central storage
Slide 32: Labels for Central Storage Areas	Present some accepted labels for central storage areas
Slide 33: Example of a Central Storage Area at a Hospital	Photo is from the UNDP GEF Project in India
Slide 34: Example of a Central Storage Area at a Hospital	
Slide 35: Storage of Infectious Waste and Sharps	
Slide 36: Storage Times for Infectious Waste	Go through table giving storage times for infectious waste
Slide 37: Pathological Wastes Storage	Present key ideas for storing pathological wastes. Storage area conditions should be the same as those for infectious and sharps waste.

Slide 38: Pharmaceutical Wastes Storage	In general, pharmaceutical wastes can be hazardous or non-hazardous, liquid or solid in nature, and each case should be handled differently. Provide examples of non-hazardous pharmaceutical wastes that can be stored in the non-hazardous waste storage area.
Slide 39: Pharmaceutical Waste Storage	Hazardous pharmaceutical wastes should be stored according to their chemical characteristics or specific requirements for disposal. Genotoxic waste is highly toxic and should be identified and stored carefully away from other healthcare wastes in a designated secure storage location.
Slide 40: Chemical Wastes storage	Go over the elements of proper chemical wastes storage in this and the following slide. The storage area for chemical wastes should be secure and separate from those for other types of waste.
Slide 41: Chemical Wastes storage	When storing wastes, if more than one hazard class is defined for a specific waste, use the most hazardous classification: -explosive waste -corrosive acid waste -corrosive alkali waste -toxic waste -flammable waste -oxidative waste -halogenated solvents (containing chlorine, bromine, iodine, or fluorine -non-halogenated solvents Storage areas for explosive or flammable chemicals must have suitable ventilation above and below, with a bonded floor and constructed from materials able to withstand explosion or leakage.

Slide 42: Examples of Chemical Waste Storage	
Slide 43: Radioactive Wastes Storage	Radioactive wastes should also be labeled with the period of time before full decay occurs. A minimum storage time of 10 half-life times for radioisotopes in wastes with half-lives of fewer than 90 days is a common practice. Infectious radioactive wastes need to be decontaminated before disposal.
Slide 44: Radioactive Wastes Storage	The storage area should be clearly marked with the words RADIOACTIVE WASTE and the international hazard label should be visibly placed on the door. It is also recommended that an air extraction system and radioactive monitoring system be in place. μSv = microsieverts → SI derived unit of equivalent radiation dose The older unit for radiation dose is the rem. 1 microsievert = 0.0001 rem or 0.1 millirem.
Slide 45: What is Wrong With This Picture?	The wheeled cart is overfilled and the waste is not segregated. The cart does not have any symbols or text and is not color-coded if used for infectious waste. It has no lid and is leaking. The cart has apparently not been cleaned regularly.
Slide 46: What is Wrong With This Picture?	Some of the infectious waste bags have not been sealed. The waste inside the bags are not well segregated; some waste appear to be general waste. The storage area has not been kept clean. Waste bags have been stacked in a manner that could cause some of them to fall. At least one waste bag is on a piece of cloth which could get contaminated and would be difficult to clean.
Slide 47: What is Wrong With This Picture?	The infectious waste containers are overfilled. The wheeled bins are of different colors and are not labeled or marked with the biohazard symbol. They have not been cleaned regularly. The storage area has blood on the floor and has not been cleaned regularly. The storage area is accessible to insects and birds.
Slide 48: Country-specific requirements	Add your country specific requirements or guidelines for transport and storage of HCW on-site.

Slide 49: Pictures	You may add pictures of carts, equipment, and storage areas in the current facility or other facilities in the country.
Slide 48: Discussion	Generate discussion with class based on the review questions.
References (in order as they appear in slides)	Blue Book Chapter 7

ACTIVITY: MODULE 13: EXERCISE (1 HOUR)

The purpose of this activity is for the participants to develop routing plans for healthcare waste in their facility.

Instructor: Break class into groups of three or more, and distribute exercise at beginning of class. You may group participants by facility, department, or job type. Participants will complete the activity in groups and record their answers in the facility maps provided. Instructor should record participant/group responses on a wipe board, flip chart, or transparency, categorize their responses.

Instructor will go over the responses, once again, during the de-brief.

MODULE 13 EXERCISE: INTERNAL WASTE TRANSPORT PLAN

Instructor will need to provide a floor plan of the facility or specific ward or area. Or participants may use the same floor plan from Exercise 12. Participants will be asked to:

1. Delineate on the map a safe route for the collection and transport of waste on-site.
2. Participants will also write the currently available procedures for the periodic inspection, cleaning, and disinfection of on-site waste transport equipment specific to their healthcare facility, and
3. Describe on-site central storage facilities as well
4. Discuss any barriers or weaknesses.

De-brief

Each group will present their floor plan for transporting wastes, and the instructor will identify the pros and cons of the current transport procedures at the facility.