

Medical Waste Management

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Objectives:

Discuss the different types of hospital waste
Describe the health impact of hospital waste
Discuss the reasons for waste management failure

Health-care activities, protect and restore health and save lives. But what about the wastes and by-products they generate? Of the total amount of waste generated by health-care activities, about 80% is general waste comparable to domestic waste. The remaining 20% is considered hazardous material that may be infectious, toxic or radioactive.

Types of waste

Waste and by-products cover a diverse range of materials, as the following list illustrates (percentages are approximate values):

- **infectious waste:** waste contaminated with blood and its by-products, cultures and stocks of infectious agents, waste from patients in isolation wards, discarded diagnostic samples containing blood and body fluids, infected animals from laboratories, and contaminated materials (swabs, bandages) and equipment (such as disposable medical devices);
 - **pathological waste:** recognizable body parts and contaminated animal carcasses;
 - **sharps:** syringes, needles, disposable scalpels and blades, etc.;
 - **chemicals:** for example mercury, solvents and disinfectants;
 - **pharmaceuticals:** expired, unused, and contaminated drugs; vaccines and sera;
 - **genotoxic waste:** highly hazardous, mutagenic, teratogenic¹ or carcinogenic, such as cytotoxic drugs used in cancer treatment and their metabolites;
 - **radioactive waste:** such as glassware contaminated with radioactive diagnostic material or radiotherapeutic materials;
- heavy metals waste:** such as broken mercury thermometers.

Infectious and anatomic wastes together repre-

sent the majority of the hazardous waste, up to 15% of the total waste from health-care activities. Sharps represent about 1% of the total waste but they are a major source of disease transmission if not properly managed. Chemicals and pharmaceuticals account for about 3% of waste from health-care activities while genotoxic (a toxic agent that damages DNA molecules in genes, causing mutations, tumors, etc.) waste, radioactive matter and heavy metal content account for around 1% of the total health-care waste. (sheet)

Segregating Waste

- Follow a color-coded waste container system for each of these waste types and segregate the waste into the appropriate container. (WHO Color Recommendations)
 - Noninfectious health care waste: Black.
 - Infectious health care waste: Yellow.
 - Sharps waste: needle remover, safety box, or other puncture-proof and leak-proof sharps containers (usually red).

Proper Handling

- Providers segregate waste at point of use.
- Waste should **NEVER** be re-sorted.
- Seal all waste containers and label to describe contents.
- Reuse and/or recycle household waste whenever appropriate.
- Retractable syringes are to be placed into a safety box or infectious waste bag after the needle is retracted, according to facility guidelines.

Reducing Risk

- Wash hands after working with waste or infected material.
- Handle all sharps with care to minimize needle stick injury.
- If you handle waste, wear appropriate protective clothing, including a water-resistant apron, thick gloves, boots or closed-toe shoes, and eye protection.
- Do not sort waste or open waste containers to sort waste.

- Be aware of procedures for treatment of injuries, cleaning of contaminated areas, and reporting sharps injuries or accidents.
- Report sharps injuries to the appropriate personnel.
- Injuries should be followed up by post-exposure prevention treatment.
- Managers should maintain a log of all accidents.
- A full course of hepatitis B and tetanus vaccination will protect you from the hepatitis B virus and tetanus—anyone handling sharps should be vaccinated.

Protective Clothing

Health workers protect themselves by establishing a barrier between themselves and the infective agent. The type of protection needed depends on the worker's activities.

Protective clothing must be worn at all times when working with health care waste. It must be properly maintained and kept clean. The clothing should not be taken home; it must remain at the health facility to avoid possible contamination of the community.

Protective clothing includes:

- Gloves: always wear gloves when contaminated items are handled. Puncture-resistant gloves should be used when handling sharps containers or bags with unknown contents.
- Boots or closed-toe shoes: rubber boots or leather shoes provide extra protection to the feet from injury by sharps or heavy items that may accidentally fall. They must be kept clean. When possible, avoid wearing sandals, thongs, or shoes made of soft materials.
- Aprons: rubber or plastic aprons provide a protective, waterproof barrier to the body.
- Goggles: plastic goggles can protect the eyes from accidental splashes.

Sharps Waste-Why Prioritize

- If not properly disposed of, scavengers may collect and reuse sharps waste.
- Reusing syringes and needles results in high risk of infection or disease transmission.
- Sharps can cut or puncture the skin, and, if they are contaminated, they can cause an

infection or disease including:

- Hepatitis B
- Hepatitis C
- HIV
- Increasing use of disposable and auto-disable (AD) syringes to help prevent bloodborne diseases has resulted in more sharps waste.
- Sharps waste must be immediately contained to prevent injury. There are two main ways to contain sharps: safety boxes and needle removers.

Roles and Responsibilities for Waste Management

Managers

- Obtain and be familiar with national waste management policies.
- Develop facility waste management plan (goal, budget, personnel, roles, supervision, training, reporting).
- Ensure supply of safety boxes, needle removers, or other sharps containers, designate appropriate and secure storage for used sharps.
- Identify and budget for final disposal method including transport and fees.
- Create climate of support for needle stick injury reporting, any splashing of liquid waste, as well as any contamination of staff by waste
- Develop protocol for management of needle stick injury.
- Advocate for health worker safety.

Injection Providers

- Follow waste management policies.
- Follow color-coded waste segregation system.
- Place sharps containers properly.
- Immediately dispose of sharps in closed container.
- Store any medical waste in secure location.

Waste Handlers

- Know color-coding system.
- Collect filled sharps containers.
- Ensure waste is securely stored until disposal.
- Use protective equipment when handling medical waste.

□ Provide waste to waste collection vehicle or service (Path).

Risks associated with waste disposal

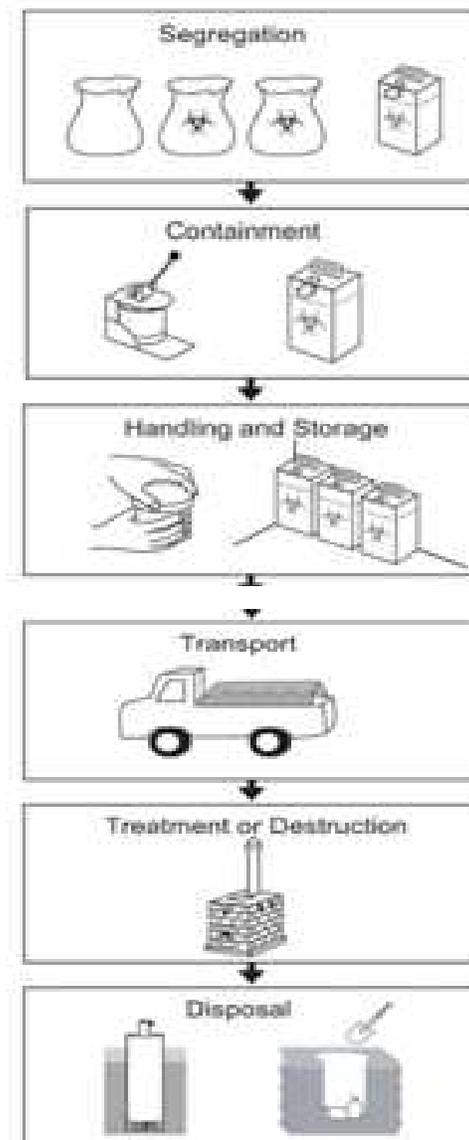
Although treatment and disposal of health-care waste reduces risks, indirect health risks may occur through the release of toxic pollutants into the environment through treatment or disposal.

- Landfills can contaminate drinking-water if they not properly constructed. Occupational risks exist at disposal facilities that are not well designed, run, or maintained.
- Incineration of waste has been widely practiced but inadequate incineration or the incineration of unsuitable materials results in the release of pollutants into the air and of ash residue. Incinerated materials containing chlorine can generate dioxins and furans², which are human carcinogens and have been associated with a range of adverse health effects. Incineration of heavy metals or materials with high metal content (in particular lead, mercury and cadmium) can lead to the spread of toxic metals in the environment. Dioxins, furans and metals are persistent and bio-accumulate in the environment. Materials containing chlorine or metal should therefore not be incinerated. Only modern incinerators operating at 850-1100 °C and fitted with special gas-cleaning equipment are able to comply with the international emission standards for dioxins and furans. Alternatives to incineration are now available, such as autoclaving, microwaving, steam treatment integrated with internal mixing, and chemical treatment.

Waste management: reasons for failure

Lack of awareness about the health hazards related to health-care waste, inadequate training in proper waste management, absence of waste management and disposal systems, insufficient financial and human resources and the low priority given to the topic are the most common problems connected with health-care waste. Many countries either do not have appropriate regulations, or do not enforce them. An essential issue is the clear attribution of responsibility for the handling and disposal of

waste. According to the 'polluter pays' principle, the responsibility lies with the waste producer, usually the health-care provider, or the establishment involved in related activities. To achieve the safe and sustainable management of health-care waste, financial analyses should include all the costs of disposal (sheet).



Bibliography:

Path: "Training Healthcare Workers in the Management of Sharps Waste", Version I, 2005

WHO: Factsheet: Waste From Healthcare Activities, 2011: www.who.org

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- 1. Several types of waste include; infectious waste, pathological waste, chemical waste, radioactive waste and sharps waste.
True False
- 2. Sharps represent about 1% of the total waste but are not a major source of disease transmission.
True False
- 3. Just as washing hands is necessary to prevent the spread of infection, one must also wash hands after handling waste of any kind.
True False
- 4. Any injury or needlestick incurred while handling medical waste must be reported immediately.
True False
- 5. It is not necessary to wear personal protective equipment when handling medical waste.
True False
- 6. It is possible to get Hepatitis from a needlestick from a contaminated needle.
True False
- 7. If waste is not properly disposed of, it is possible to contaminate ground water from the landfill.
True False
- 8. Modern incinerators must follow international guidelines and be outfitted with special gas-cleaning equipment.
True False
- 9. Infectious waste is considered to be anything contaminated with blood and its by-products.
True False
- 10. It is OK to reuse or recycle household waste rather than discard it.
True False

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