

Health Care Waste

Hospital waste

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SPECIFIC LEARNING OBJECTIVES

The student will be able :

- to define the health care-waste
- to describe the classification of health care- waste
- to describe the sources of health care waste
- to describe risks associated with health care waste
- to describe the health impacts of health care waste
- to describe the handling, storage and transportation of health care waste
- to describe the treatment and disposal technologies for health care waste

References

- Prüss A, Giroult E, Rushbrook P, eds. Safe Management of Wastes from Health-care Activities. Geneva: World Health Organization, 1999.
- WHO, Prüss, Giroult, Rushbrook, ed., Safe Management of wastes from health-care activities, Geneva, 1999, . Chapter:2,3,7,8
- Health care waste and its safe management : <http://www.healthcarewaste>

1. Definition the health care-waste

Health care waste includes all the waste generated by health care establishment, research facilities, and laboratories

- 10-25 % of health care waste is regarded as hazardous and may create a variety of health risk

2. the classification of health care- waste

The 10-25 % hazardous fraction of health care waste are usually classified into the following waste groups :
(Categories of health care waste)

1. Infectious waste
2. Pathological waste
3. Sharps
4. Pharmaceutical waste
5. Genotoxic/cytotoxic waste
6. Hazardous Chemical waste
7. Waste with high content of heavy metals
8. Pressurized containers
9. Radioactive waste
10. Highly infectious waste

Categories of health care waste

No	Waste category	Description and example
1	Infectious waste	Waste suspected to contact pathogens. Exp. Lab culture, tissues, material or equipment
2	Pathological waste	Human tissues or fluid e.g body parts, blood, body fluids
3	Sharps	Sharp waste Eg. Needles, infusion sets, scalpels, knives, broken glass.
4	Pharmaceutical waste	Waste containing pharmaceutical Eg. phar. Expired.
5	Highly infectious waste	Consists in microbial culture and stock of highly infectious agent from medical analysis laboratories. Eg. Body fluids

6	Genotoxic waste	Waste containing substances with genotoxic properties e.g waste containing cytotoxic drugs, genotoxic chemicals
7	Chemical waste	Waste containing chemical substances e.g. reagents, disinfectant, solvents
8	Waste with high content of heavy metals	Bateries, broken thermometre, blood pressure gauges
9	Pressurized containers	Gas cylinders, gas cartridge, aerosol cans
10	Radioactive waste	Waste containing radioactive substance e.g unused liquids from radiotherapy

3. The sources of health care waste

The sources of health care waste can be classified as

1. Major sources of health care waste
2. Minor sources of health care waste

Major sources of health care waste

1. Hospital
2. Other health care establishment
3. Related laboratories and research centres
4. Mortuary and autopsy centres
5. Animal research and testing
6. Blood banks and blood collection services
7. Nursing home for elderly

Other health care establishment

- Emergency medical care services
- Health care centres and dispensaries
- Obstetric and maternity clinics
- Outpatient clinics
- Dialysis centres
- First aid posts and sick bays
- Long term health care establishment and hospices
- Transfusion centres
- Military medical services

Related laboratories and research centres

- Medical and biomedical laboratories
- Biotechnology laboratories and institutions
- Medical research centres

Minor sources of health care waste

1. Small health care establishments
 - Physicians office
 - Dental clinics
 - Acupuncturist
 - Chiropractors
2. Specialized health care establishments and institutions with low waste
 - Convalescent nursing homes
 - Psychiatric hospitals
 - Disabled persons institutions
3. Non health activities involving intravenous or subcutaneous interventions
 - Cosmetics ear piercing and tattoo parlours
 - Illicit drug users
4. Funeral services
5. Ambulance Services
6. Home treatment

Risk associated with Health Care Waste

- All individuals exposed to healthcare waste are potentially at risk of being injured or infected. They include :
 1. Medical staff : doctors, nurses, sanitary staff and hospital maintenance personnel
 2. In and out patients receiving treatment in health care facilities as well as visitors
 3. Workers in support services : laundries, waste handling and transportation services
 4. Workers in waste disposal facilities
 5. The general public , children playing with the items they can find in the waste outside the healthcare facilities.

- The general public can be infected by health care waste directly or indirectly through several routes of contaminations
 - recycling → reuse of syringe
 - unsafe injection practices
 - sale of recovered drugs in the informal sector
(elimination of expired drugs is uncontrolled)
- The dumping of health care waste in uncontrolled areas can have a direct environmental effect by contaminating soils and underground waters

4. The health impacts of health care waste

Person at risk of health care waste

- Medical doctors, nurses, health care auxiliaries, and hospital maintenance personnel
- Patients in health care establishment or receiving home care
- Visitors to health care establishments
- Workers in support services allied to health care establishments, such as laundries, waste handling, transportation
- Workers in waste disposal facilities (landfills or incinerator)

Hazards from infections waste and sharps

Type infections

1. Gastrointestinal infections
2. Respiratory infections
3. Ocular infection
4. Genital infection
5. Skin infection
6. Anthrax
7. AIDS
8. Haemorrhagic fever
9. Septicaemia
10. Bacteraemia
11. Candidaemia
12. Hepatitis, A, B,C

Hazards from chemical and pharmaceutical waste

- Toxic
- Genotoxic
- Corrosive
- Flammable
- Reactive
- Explosive
- Shock sensitive

They may cause :

- Intoxications
- Acute or chronic exposure
- Injuries
- Burn

Hazards from genotoxic waste

- Occur during preparation or treatment
- The main pathway are inhalation, absorption (skin), ingestion
- Exposure occur through contact with the bodily fluids and secretions of patients undergoing chemotherapy

Hazards from radioactive waste

- Health care workers, waste handling or cleaning personnel → at risk

Public Health impact of health care waste

- Impact of infectious waste and sharp
- Impact of chemical and pharmaceutical waste
- Impact of genotoxic waste
- Impact of radioactive waste

5. the handling, storage and transportation of health care waste

1. Waste segregation and packaging
2. On site collection
3. Transport
4. Storage of waste
5. Off site transportation
 - Regulation and control system
 - Special packaging requirements for off site transport
 - Labelling
 - Labelling for radioactive waste
 - Preparation for transportation
 - transportation vehicles or containers
 - Routing

The management of waste

Step 1 : waste management

Step 2 : health care waste generation

Step 3 : segregation and containerization

Step 4 : intermediate storage

Step 5 : internal transport

Step 6 : centralized storage

Step 7 : external transport

Step 8 : treatment and final disposal

- Unsafe healthcare waste management leads to death and disability

- Healthcare waste management may also represent a risk to health

6. the treatment and disposal technologies for health care waste

1. Incineration
2. Chemical disinfection
3. Wet and dry thermal treatment
4. Microwave irradiation
5. Land disposal
6. Inertization

Hospital waste management

Hospital waste is a potential reservoir of pathogenic micro organism and requires appropriate safe and reliable handling

The main risk associated with infection is sharps contaminated with blood

There should be a person or persons responsible for the organization and management of waste collection, handling, storage and disposal

Principle of waste management

Steps in the management of hospital waste include :

- Generation
- Segregation / separation
- Collection
- Transportation
- Storage
- Treatment
- Final disposal

Thankyou