

# Hospital waste management

By

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## Introduction

Hospital waste is a special type of waste produced in small quantities carrying a high potential of infection and injury. Inadequate and improper handling may have serious public health consequences and a significant impact on the environment.

Hospital waste management means the management of waste produced by hospitals using techniques that will check the spread of diseases. In developing countries, awareness regarding hospital waste management in terms of its **segregation, collection, storage, transportation and disposal is lacking**

## Categorization of health care waste

### 1. General waste

It includes domestic waste, packing material, non-infectious animal waste, bedding, wastewater from laundries and other substances that do not pose a special handling problem or hazard to human health or the environment.

### 2. Pathological waste

It consists of tissues, organs, body parts, human fetuses, animal carcasses, blood and body fluids.

### 3. Radioactive waste

It includes solid, liquid and gaseous waste contaminated with radio nuclides generated from invitro analysis of body tissues and fluid, invivo organ imaging, tumour localization and therapeutic procedures.

## 4. Chemical waste

It comprises discarded solid, liquid and gaseous chemicals, for example generating from diagnostic and experimental work, cleaning, housekeeping and disinfecting procedures. Chemical waste may be hazardous or non hazardous. For the purpose of choosing the most appropriate waste handling method, hazardous chemical waste is considered to be the waste that :

### Toxic;

Corrosive ( acid of  $\text{pH} < 2.0$  and bases of  $\text{pH} > 12.0$  ) ;

Reactive ( explosive, water reactive, shock sensitive ) ;

Geotaxis ( carcinogenic, mutagenic, teratogenic or otherwise capable of altering genetic material ) ; for example, cytotoxic drugs.

Non-hazardous chemical waste consists of chemical other than those described above, such as sugar, amino acids, and certain organic and inorganic salts.

## 5. Infectious waste

It contains pathogen in sufficient concentration or quantity and exposure that could result in diseases. This category includes cultures and stocks of infectious agents from laboratory work, waste from surgery and autopsies with infectious diseases, waste from infected patients in isolation wards.

## 6. Sharps

It includes needles, syringes, scalpels, blades, saws, glass, nails and other items that could cause a cut or puncture.

## 7. Pharmaceutical waste

It includes pharmaceutical products, drugs and chemicals that have been returned from wards, have been spilled or outdated or contaminated, or are to be discarded because they are no longer required.

## 8. Pressurized containers

It includes those containers used for demonstration or instructional purposes, containing innocuous or inert gas and aerosol cans that may explode if incinerated or accidentally puncture.

## Table 1 Categorisation of clinical waste

### GROUP

### DESCRIPTION

#### A

1. Includes the following items: identifiable human tissue, blood, animal carcasses and the tissue from veterinary centres, hospitals or laboratories.

2. Soiled surgical dressings, swabs and all other similar soiled waste.

3. Any infectious waste material excluded from Groups B-E.

#### B

Discarded syringes, needles, cartridges, broken glass and other contaminated disposable sharp instruments or items.

**C**

Microbiological cultures and potentially infected waste from pathology departments and other clinical or research laboratories.

**D**

Drugs or other pharmaceutical products.

**E**

Items used to dispose of urine, faeces and other bodily secretions and excretions that do not fall within group A. This includes used disposable bedpans or bedpan liners, incontinence pads, stoma bags, catheter bags and tubes and urine containers.



## 2. Aims of the study

1. To evaluate the current practices of segregation approaches, storage arrangements, collection, disposal and management systems in Baquba hospitals.
2. To bring hospital waste under control .
3. Legislation ( Health and safety Legislation ).

### 3. Material and methods

A cross-sectional survey will be conducted in two major hospitals in Baquba, using convenient sampling technique. The instrument of research was a self administered questionnaire, with three sections, administrative information, information regarding Health Waste Management personnel and a check-list of Hospital Waste Management activities.

## 4. Conclusions

If the overall goal of waste management is to prevent disease transmission from waste products, therefore the emphasis should be placed on the "Management" aspect of the process and technology should fit the situation and work in the management system to achieve the final goal. National standards for operating acceptable treatment technologies should be set which should match the international standards practiced in the developed countries.

1. Health care waste management in Baquba is a bad shape. The general awareness on the subject is very much lacking both by the producers as well as handlers of waste. The health care is usually being dumped and mixed with the domestic and commercial waste which is collected, transported and disposed in similar manner as the general solid waste.

2. The data, information and statistics on the health care waste sources, generation collection, transportation, treatment and disposal is lacking. No studies have been undertaken by the municipality, health, EPA, and any governmental agency.

3. The sanitation staff consist of uneducated persons and who are not trained to handle health care waste. No protective gears and clothing are provided to them and even simple hand gloves are not used. The sanitation staff manually handle the health care waste including the infectious waste and sharps.

4. The tools and equipments utilized by the sanitation staff includes brooms, brushes and four wheel trolleys inside the premises while one wheel trolley and buckets are used for conveying waste from inside to outside of the health care facilities. The tools and equipment are insufficient, inadequate and unhygienic in majority of cases.

5. The incinerators are not working and use manual burning.

6. No health care waste management plan , methodology, rules and regulation exists with any medical facility. No previous and on going program on waste minimization was witnessed.

7. The sewage management stations are not working. The liquid waste generated at the health care facilities are disposed either in the sewerage system with domestic waste water or is dumped outside in open, or carry by the tankers and disposed in the rivers.

8. No coordination exists among the various city agencies responsible for health care collection and storage.



## 5. Recommendations

1. Organizing awareness and training program for the staff of health care facilities.

The training should be at the three tier level including the medical

practitioner/doctor/paramedical staff, sanitation staff and users of medical facilities.

The literature, notices, brochures and appropriate awareness material through available communication modes needs to be prepared and publicized in local languages.

2. A comprehensive and detailed study needs to be undertaken to assess the quantities of solid waste generated at the health facilities. The components, composition and quantities needs to be assessed and confirmed which will form the basis of planning, designing and implementation of waste management facilities.

3. The sanitation staff needs to be provided with appropriate protection gears and clothing. Hand gloves are the most essential items required by the staff.

4. Appropriate solid waste storage containers are to be provided at all generating station/points in the health care facilities. The robust containers are to be provided to accommodate at least two days storage based on the quantity and volume of solid waste generated. Colour coded bags can be adopted for clinical waste at all hospitals and health care establishments.

5. Secondary solid waste storage facilities at the premises is much required. The facilities needs to be hygienic and covered to discourage the entry of rodents, insects, and other vermin. The storage should be of appropriate shape, size and capacity to store the waste generated.

6. Burning of health care waste to be avoided and discouraged. Open heaps of health care waste needs to be converted into proper sanitary storages which needs to be periodically cleaned and disinfected.

7. The infectious health care waste is to be completely segregated from domestic and commercial waste. Use of colour coded bags can be adopted for clinical waste at the hospitals and health care establishments

8. A centralized health care waste collection facility needs to be operated on scientific lines. The refrigerated vans should collect the waste and transfer to the incineration facilities. The ashes produced by incineration need to be sanitary disposed at the landfill site.

9. The transportation of health care waste to disposal and treatment sites needs to be done as per hygienic standards. The sanitation staff should not touch the waste and it should not come to in contact with the exposed part of the body.

10. In the absence of proper incineration facilities for destruction of infectious health care waste, other cheap and robust solutions should be adopted including sanitary land filling and utilizing proper trenching and covering material. The incinators should be installed and service should be extended to all hospitals.

11. Mass awareness campaign needs to be planned, designed and implemented to make the people aware of the consequences of infectious waste handling, storage and disposal. Appropriate communication modes needs to be used for this awareness campaign.
12. The recyclable portion of health care waste material needs to be separately stored, utilized, recycled and reused.



## Waste Segregation Waste Segregation

Different color coding has to be assigned to various waste for effective segregation, as:

- i. Black : Non-Risk waste.
- ii. Red: Risk waste with Sharps.
- iii. Blue: Risk Waste without sharps.
- iv. Yellow: Radioactive waste
- v. Green: Chemicals like Mercury & Cadmium

The image features two vibrant yellow roses in full bloom, positioned diagonally across the frame. They are set against a solid dark teal background. Several green leaves are scattered around the roses, some showing highlights and shadows that give them a three-dimensional appearance. The overall style is clean and graphic.

Thank you

very much