

# A Practical Study on Hospital Waste Management: Good Practices to be implemented in Cameroonian Hospitals

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**Abstract:** *Hospitals generate and reject material regularly, and improper management of these wastes leads to public health hazards, environmental pollution, and aesthetic appearance. Most hospitals in Cameroon are not efficient in handling wastes when compared to those in developed countries such as the United Kingdom. Both government and private ones have an outdated environmental management system. The hospital managers have very little accountability to government and they are not very worried about the issue. This paper raises the fact that there is no proper treatment facility for clinical waste in Cameroon, following research recently carried out. Awareness regarding the hazards of medical waste is lacking both in public as well as in related professionals and workers. Therefore, the possibility of getting infected for patients, workers, waste collectors and visitors is very high. Improvement of waste management in the clinics and hospitals is urgently needed both for combating occupational health hazards as well as to safeguard the environment.*

**Keywords :** *Hospitals, material, Cameroon*

## Introduction

Hospital waste is special in that it has a higher potential for infection and injury than other types of waste. Clinical waste is generated during the diagnosis, treatment or immunisation of human beings or animals as well as in research activities in these fields, or in the production or testing of biological samples. The absence of proper waste disposal has been posing serious health hazards

Solid hospital waste can be classified into different types depending on their source:

Clinical waste as infectious waste

The Health and Safety Commission [1] defines clinical waste as:

-Any waste which consists wholly or partly of human or animal tissue, blood or other body fluids, excretions, drugs or other pharmaceutical products, swabs or dressings, or syringes, needles or other sharp instruments, being waste which unless rendered safe may prove to be hazardous to any person coming into contact with it.

-Any other waste arising from medical, nursing, dental, veterinary, investigation, treatment, care, teaching or research, or collection of blood for transfusion, being waste which may cause infection to any person coming into contact with it.

Equally, The clinical waste project group project (Secretary of State for the environment and Secretary for Wales 1995), has agreed on a definition of healthcare waste that distinguishes

between two kinds of waste-household hospital waste and healthcare risk waste.

## Household waste

This is generally classified as municipal waste and includes waste from kitchen - food left over; packaging material; hand towels, wrappings, disposable cups, flowers, aerosols, empty cans and non clinical sharp broken bottles, waste papers, empty glass bottles, tin cans, used batteries; paper etc. Some of these items such as batteries, expired medicines, broken glass etc. are hazardous in nature and can harm the rag pickers on being mixed with the domestic waste. In Cameroon, clinical wastes often do not get proper attention in terms of storage, segregation, collection, transportation, treatment and disposal and they continue to be dumped in open garbage bins in most parts of the country and are often disposed of along with other municipal waste components. Almost all the health care facilities are disposing every kind of waste (hazardous, infectious, sharps etc) in nearby municipal dustbins without any pre-treatment whatsoever. An unhealthy and hazardous environment exists in and around these facilities, affecting patients, staff and visitors. Scavengers who collect waste from dustbins are at risk from sharps, pharmaceuticals and chemicals, and from direct contact with infectious materials. Unlike in the United Kingdom, recycling of wastes is flourishing and many useful constituents are retrieved, segregated and recycled by the informal sector.

## Procedure

The following approaches were undertaken in both countries UK and Cameroon: The questionnaires, inspections of some hospitals were done; photographs were taken to show the difference between two waste management systems in terms of handling, storage, and disposal options, inspection of some treatments and disposal sites, informal interviews of personnel related with health care waste management system.

From these responses, a number a good practice case studies were identified and they illustrate examples that can be adopted by Cameroonian hospitals.

## Cameroon

The types of bins used in hospitals here are generally not adequate. Government hospitals, private and mission ones dispose of their waste either clinical or household in plastic bins with cover, without any protection. Also, hospitals have few pedal bins, which are sometimes very small and waste containers are usually not labelled. When labelled the name of the hospital instead of the type of waste (clinical or household) appears on the container. The distribution of the bins is also to be addressed because it is mostly done per ward and rarely per room. The collection of waste is being done daily everywhere either by the sweepers or sanitation staff, at the points of gen-

eration such as treatment- room, wards, laboratory. Segregation of waste is almost absent and where this is practised, it is not properly done. Therefore, bloodied bandages, cotton swabs, and syringes and other infected wastes are commonly found within other households, in unprotected plastic bins as mentioned earlier. In few facilities, there is a resistant container only for the collections of needles even though not appropriate. Electric needle distracter to discard used needles or the safety box provided by the WHO are used in some places. In all the hospitals no policy is recognized and health and safety issues, completely neglected. Storage areas are generally open and waste waiting to be transported to the dumping site is readily available to insect and rodent vectors (such as flies, mosquitoes, and rats) and scavenging animals (Figure1).



Figure 1: Example of open storage area for wastes.

### Final disposal options

In Cameroon, there are no proper landfill sites but a variety of disposal options such as:

#### Open dumps

They are, uncovered areas used to dump solid waste of all kinds. They are characterised by uncontrolled and scattered deposit of waste, which is untreated,

uncovered and not segregated (Figures 1 and 2). This is the breeding ground for flies, rats and other insects that spread diseases as it is now acknowledged that certain categories of hospital (or clinical) waste are among the most dangerous of all wastes arising in the Community (Bradshaw et al [4]).

The rainwater run-off from these dumps contaminates nearby land and water.

Most of the hospitals dispose of their wastes through this option.



Figure 2: Example of open dump.

### Safe burial in the hospital premises

Some of the health-care establishments use minimal programme for waste management practice in form of safe burial of waste that is the only viable option available at the time.

#### Dumping sites

These sites are generally located in urban areas where large amount of waste is generated and has to be dumped in commonplace. In Cameroon, all types of waste is dumped in those sites and when water seeps through them it gets contaminated and in turn pollutes the surrounding area.

#### Causes of inadequate waste management

There are number of reasons for the inadequate waste management in Cameroon, and some of the most common are listed below.



Figure 3: Infected wastes dumped in front of the incinerator building.

First of all, there is a lack of awareness about the inherent hazards caused by improper health care waste management and the absence of training of the staff.

Poverty is also an important factor due to insufficient allocation of resources (financial and human). In one of the biggest governmental hospitals, there are only two people in charge of the collection of waste and one to operate the incinerator.

Infected waste is sometimes dumped in front of the incinerator building for many weeks in this hospital, because of shortage of money for the petrol (Figure 3). Additionally improper control of the management process and poor land filling technology may cause water pollution in the form of leachate. It is important to mention the absence of a monitoring programme for dumping sites as well as a national policy for the management of health cares wastes. The motivation of the staff in terms of salaries is also to be pointed out because the rate of pay is very low.

#### Consequences of the improper management of wastes

Staff working on waste treatment sites is exposed to many diseases due to the poor personal equipment including chronic diseases such as respiratory ones, cancers, due to the exposure to dust and hazardous compounds.

Also they may have accidents such as bone and muscle disorders resulting from the handling of heavy containers as well as infecting wounds due to the contact with sharps objects. During the author's visit in one the biggest government hospitals, the waste manager reported the case of his worker who died few months ago, from HIV infection that he may have had while handling waste.

It is equally important to mention that waste treatment and disposal sites can also be a hazard to the neighbourhood and farms, and an improperly operated incineration plant can cause air pollution.



Figures 4 and 5: Example of incineration sites close to the farms and human settlements.

Normally, these treatment sites should be at a safe distance from all human settlement and plantations. Furthermore in Cameroon, the recycling reuse process is absent or when it is practised, poor. There is no segregation of recyclable items at the point of generation.

### Waste management in the United Kingdom

The waste management system is well organised. This study reveals that in the country, there is a national legislation for the control of hospital wastes.

All clinical wastes are collected in yellow containers whereas households are in black plastic bags. There is a label either on the pedal bins and plastic bags. WHO [3] recommends that most appropriate way of identifying the categories of health-care waste is by sorting the waste into colour-coded plastic bags or containers.

The aim of this safe and efficient hospital waste management is that following use each item for disposal should be segregated into an appropriate disposal container at the point of use. Bins are distributed almost everywhere: in wards, rooms, toilet, corridors, etc.

### Segregation-at-source

This is practised at each point of generation as follow. Infected dressing, sharps, catheters, wound drains, etc are collected in pedal bins lined with yellow plastic bags that are marked with biohazard label (Figure 6).



Figure 6: Pedal bin lined with yellow plastic bag.



Figure 7: Pedal bin lined with black plastic bags

Households such as flower, paper and plastic packaging are collected in black bags lined in pedal bin (Figure 7).

Waste suitable for recycling: aluminium, glass and plastic drink containers; newspaper magazines, paper-cup etc are collected in blue carton or in green container (Figure 8).



Figure 8: Recycling point.

### Waste handling

There are written procedures for all the steps in hospital waste management and the staff is trained to follow these procedures. Sharps should be disposed of directly into clearly marked sharp containers (Figure 9).



Figure 9: Sharps container.

Single -use disposable containers are available in a range of sizes with lids, which lock on seal the container. These containers should never be filled to the top. The lid should be closed when the full line marked on the outside of the container is reached and this is usually around two-thirds to three-quarters full. When disposable sharp containers are full and have been sealed, they are put into the clinical waste bins.

### Transport and storage within the hospital

Wastes are removed from clinical areas and ward several times daily by porters as soon as they are full. Also, the individual mobile garbage bins is wheeled or taken on trolleys or in purpose-built structure to store waste. The storage area is dry, lockable, secure against rodents, have insect controls and appropriate wash-down and cleaning facilities (Figure 10).



Figure 10:Storage area in a ward.

The basic cleaning equipment includes brooms, shovels, disinfectant, granular chlorine compound for blood spillage and hypochlorite for cleaning up, and sand in plastic bag for use with the spill kit. Equally, the basic protective clothing kit includes boots, disposable thick gloves and overalls.

### Disposal and treatment options

#### Incineration

This option is adopted for the treatment of infected waste, and the ash is taken to the landfill site. Most of the health facilities do not get incinerator on site but everything is well organized in a way that there are regional incinerator plants.

#### Sanitary landfills

An alternative to landfills which will solve the problem of leaching to some extent is a sanitary landfill. They are more hygienic, built in a methodical manner, and are characterized by the controlled and organised deposit of wastes, which is then covered regularly (daily) by the staff present on site. An appropriate engineering preparation of the site and a favourable geological setting (providing an isolation of wastes from the environment) are required.

These are lined with materials that are impermeable such as plastics and clay, and are also built over impermeable soil. Constructing sanitary landfills is very costly and they are having their own problems. Some authority claim that often the plastic liner develops cracks as it reacts with various chemical solvents present in the waste. The rate of decomposition in sanitary landfills is also extremely variable. This can be due to the fact that less oxygen is available as the garbage is compressed very tightly.



Figures 11 and 12: A landfill site.

In The UK, the whole process of waste management is strictly regulated in order to protect human health and the environment. All leachate discharges to groundwater, surface and marine waters are controlled under the Water Resources Act 1991 (England and Wales). Additionally, the waste management licence holder has to ensure protection of the environment from his operation and show that financial provision has been made to remedy any environmental damage that may result, Barron [2].

### Recycling

To gain the maximum benefit from waste minimization by recycling, effective segregation - at source is practised and understood by all staff. Typical products, which may be able to be successfully recycled, include paper from administrative offices, records and stores Departments (bins clearly mark as "clean paper for recycling" taken to central point when full), cardboard cartons in which various clean stores are received and aluminium cans.

In conclusion, replication of successful practices and implementation of pilot activities is advantageous in providing necessary information to local governments for effective hospital waste management.

The transfer and application of locally appropriate technologies and enforcement mechanisms should be considered to address diverse situations and issues, and stressed the importance of the roles of the public and private sector, as well as capacity building of local governments.

### Basic requirements for improvement in Cameroon

These include the proper methods of waste disposal which have to be undertaken to ensure that it does not affect the environment around the area or cause health hazards to the people living there. At the household-level proper segregation of

waste has to be done and it should be ensured that all organic matter is kept aside.

First of all, an assessment of the situation as well as awareness rising is important. Also, a legal framework and a policy should be set and, has to be implemented locally. Additionally, there is a need for the training and behavioral change of the staff. It is equally important to prepare and implement hospital-specific action plans for collection, handling, storage, transport, treatment and disposal of hospital waste. Furthermore, availability of equipment is important to be mentioned and for this concern, The Ministry of Public Health should:

Promote greater awareness among the staff of the need to manage waste, equipment of health-care facilities properly and consider the scope for promoting the use of benchmarks of performance and good practice in health and safety management, against which Hospitals can monitor their own performance. Equally, The Government should encourage the creation of recycling centres all over the country and of municipal incinerators located reasonably close to hospitals. When health-care waste is delivered to the incineration plant, the packaging should be checked to ensure that it is undamaged. Open burning of bio-medical waste should be strictly avoided. Pollution control devices should be used for technology produces toxic emissions. The design parameters and maintenance of such treatment and disposal technology should be as per the prescribed standards. Ministry of Public Health and of Environment, and other local authorities who are responsible for the job should communicate in order to stop this hospital waste menace. Also, policies should be formulated which would involve Non Government Organizations, community based organizations and the private sector in waste management

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