

Clinical wastes in Malaysia

Guidelines on the handling and management

Department of Environment, Malaysia

The Basel Convention has prompted countries to frame their own legislations and guidelines with regard to the management and control of hazardous wastes. Malaysia is no exception. The country has taken comprehensive steps to mitigate this menace by developing and implementing appropriate laws and guidelines. In particular, Malaysia has recognized the importance of regulating and managing clinical and healthcare wastes. The article provides details of the specific set of guidelines formulated for the handling and management of these wastes in Malaysia.

Introduction

The disposal of wastes arising from healthcare establishments (public and private) can have an effect on:

- the health and human well-being;
- the environment; and
- issues relating to the public safety.

These guidelines provide information for the proper handling and management of clinical wastes from healthcare establishments (public and private). The information takes due consideration of the waste management requirements in the Environmental Quality Act of 1974 which is administered by the Department of Environment.

These guidelines have also included the safety and health features in clinical waste management recommended by the Ministry of Health, Ma-

laysia in order to protect health of staff, waste collection workers, patients and the general public.

The safe management of clinical waste is essential for community and environmental health. It is also important that, irrespective of technologies used for treatment and disposal, the standards for the protection of the environment and human health are uniform across all the healthcare establishments.

The growing concern over the need for a proper management of clinical waste in Malaysia has prompted the Government to establish a comprehensive clinical waste collection, transportation and disposal system for all the Government hospitals through a privatisation program. Private healthcare establishments are likewise re-

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quired to ensure proper management of their clinical wastes. General waste accounted for 60 to 80 percent of the total waste generated by the hospitals. The remainder is made up of clinical, radioactive and chemical wastes. It is estimated that the generation rate for clinical wastes varies from 0.3 to 0.8 kg per occupied bed per day.

To manage clinical wastes effectively, consideration needs to be given to:

- Generation and minimisation;
- Source separation and segregation;
- Identification and labelling;
- Handling and storage;
- Safe transportation;
- Treatment;
- Disposal of residues (including emissions);
- Occupational safety and health;
- Public and environmental health; and
- Research and development into improved technologies and environmentally friendly practices.

Definition

To get a better understanding of waste management at healthcare facilities, there is a need to have a common and internationally accepted definition for the waste generated in those facilities. The following definitions are set by these guidelines:

Healthcare

Medical activities such as diagnosis, monitoring, treatment, prevention of disease or alleviation of handicap in humans or animals, including related research, performed under the supervision of a medical practitioner or veterinary surgeon or another person authorised by virtue of their professional qualifications.

Healthcare wastes

Solid and liquid waste arising from healthcare (including collected gaseous waste).

Hazardous healthcare wastes

Biological (recognisable anatomical waste) and pathological waste, chemical, toxic or pharmaceutical waste in-

cluding cytotoxic drugs (anti-neoplastics), sharps (e.g. needles, scalpels) and radioactive wastes.

Infectious healthcare wastes

All healthcare waste known or clinically assessed by a medical practitioner or veterinary/surgeon to have the potential of transmitting infectious agents to humans or animals:

- a. discarded materials or equipments contaminated with blood and its derivatives, other body fluids or excreta from isolated infected patients.
- b. laboratory waste (cultures and stocks with any viable biological agents artificially cultivated to significantly elevated numbers and infected animals from laboratories).

Sharps

All healthcare waste with sharps or pointed parts able to cause an injury or an invasion of the skin barrier in the human body. Sharps from isolated infected patients or from infected patients undergoing haemodialysis are categorised as infectious waste.

Identification, classification and waste group

Wastes from hospitals and healthcare establishments can be categorized into the following types:

- Clinical waste;
- Radioactive waste;
- Chemical waste;
- Pressurized containers; and
- General waste.

Clinical wastes are wastes containing:

- Human or animal tissue;
- Blood or body fluids;
- Excretions;
- Drugs;
- Pharmaceutical products;
- Soiled swabs or dressings;
- Syringes, needles, sharps;
- Any waste that has come into contact or been mixed with any of the above types of wastes; and
- Waste unless rendered safe may prove hazardous to any person coming into contact with it.

In Malaysia, clinical waste is classified as scheduled waste under the Environmental Quality (Scheduled Wastes) Regulations, 1989 which includes:

- N251 discarded drugs, except living vaccines and euphoric compounds;
- N261 pathogenic and clinical wastes and quarantined materials;
- N281 a mixture of scheduled wastes; and
- N282, a mixture of scheduled and non-scheduled wastes.

To further define clinical wastes, the Ministry of Health has included these definitions in its guidelines:

- 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, syringes, needles or other sharp instruments, being waste which unless rendered safe may prove hazardous to any person coming into contact with it; and
- Any other waste arising from medical, nursing, dental, veterinary, pharmaceutical or similar practices, investigation, treatment, care, teaching or research, or the collection of blood for transfusion, being waste which may cause infection to any person coming into contact with it.

The following classification is based on the major classification of clinical waste, but specified for practical use in the healthcare sector. Therefore, waste from healthcare establishment is classified into different groups (Table1).

Field of application/source identification

These guidelines shall be applicable for clinical wastes generated from healthcare establishments. Healthcare establishments shall be grouped as follows:

Large source

- University hospitals and clinics;
- Maternity hospitals and clinics; and
- General hospitals.

Medium source

- Medical centres;
- Out-patient clinics;
- Mortuary/autopsy facilities;
- Farm and equine centres;
- Hospices;
- Medical laboratories;

Special Feature : Hazardous Waste Management

Table 1: Major classification of clinical waste and its recommended management guidance in Malaysia

Description	Waste management guidance
<p>Blood and body fluid waste</p> <p>i. Soiled surgical dressings, e.g. cotton wool, gloves, swabs. All contaminated waste from treatment area. Plasters, bandages which have come into contact with blood or wounds, cloths and wiping materials used to clear up body fluids and spills of blood.</p> <p>ii. Material other than reusable linen, from cases of infectious diseases (e.g. human biopsy materials, blood, urine, stools)</p> <p>iii. Pathological waste including all human tissues (whether infected or not) organs, limbs, body parts, placenta and human foetuses, animal carcasses and tissues from laboratories and all related swabs and dressings.</p>	<p>Special requirement on the management from the viewpoint of infection prevention. These category of waste must always be incinerated completely in an appropriate incinerator.</p>
<p>Waste posing the risk of injury (“sharps”)</p> <p>All objects and materials which are closely linked with healthcare activities and pose a potential risk of injury and/infection, e.g. needles, scalpel blades, blades and saw, any other instruments that could cause a cut or puncture.</p>	<p>Collected and managed separately from other waste. The collection containers must be puncture-resistant and leak-tight. This category of waste has to be disposed/destroyed completely as to prevent potential risk of injury/infection.</p>
<p>Infectious wastes</p> <p>Clinical waste arising from laboratories (e.g. pathology, haematology, blood transfusion, microbiology, histology) and post mortem rooms, other than waste included in category 1 waste.</p>	<p>Special requirement on the management from the viewpoint of infection prevention. This category of waste must always be incinerated completely in an appropriate incinerator.</p>
<p>Pharmaceutical and Cytotoxic Pharmaceutical Wastes</p> <p>i. Pharmaceuticals which have become unusable for the following reasons:</p> <ul style="list-style-type: none"> ● expiry date exceeded; ● expiry date exceeded after the packaging has been opened or the ready-to-use preparation prepared by the user; or ● use is not possible for other reasons (e.g. call-back campaign) <p>ii. Wastes arising in the use, manufacture and preparation of, and in the oncological treatment of patients with, pharmaceuticals with a cytotoxic effect (mutagenic, carcinogenic and teratogenic properties).</p>	<p>Class I – pharmaceuticals such as camomile tea, cough syrup, and the like which pose no hazard during collection, intermediate storage and waste management: managed jointly with municipal wastes.</p> <p>Class II – pharmaceuticals which pose a potential hazard when used improperly by unauthorized persons: managed in an appropriate waste disposal facility.</p> <p>Class III – Heavy metal-containing unidentifiable pharmaceuticals: managed in an appropriate waste disposal facility. Intermediate storage of these wastes takes place under controlled and locked conditions. For reasons of occupational safety, cytotoxic pharmaceutical wastes must be collected separately from pharmaceutical waste and disposed of in a hazardous waste incineration plant.</p>
<p>Other infectious wastes</p> <p>All healthcare waste known or clinically assessed by a medical practitioner or veterinary/surgeon to have the potential of transmitting infectious agents to humans or animals. Used disposable bed-pan liners, urine containers, incontinence pads and stoma bags.</p>	<p>Disposed of in a hazardous waste incineration plant.</p>

- Medical research facilities;
- Animal hospitals;
- Blood banks and transfusion centres; and
- Emergency services.

Small source

- General medical practitioners;
- Convalescent homes;
- Nursing and remedial homes;
- Medical consulting rooms;
- Dental practitioners;
- Animal boarding and hunt kennels;
- Tattooists;
- Acupuncturist;
- Veterinary Practitioners;
- Pharmacies; and
- Cosmetic piercers.

Hazardous waste legislation

The Department of Environment (DOE) is empowered under the Environmental Quality Act 1974 to control and prevent pollution and to protect and enhance the quality of the environment. A set of regulations dealing with hazardous waste management which regulate the storage, transport, treatment and disposal of hazardous wastes was enforced on May 1989:

- Environmental Quality (Scheduled Wastes) Regulations, 1989;
- Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities) Regulations, 1989; and
- Environmental Quality (Prescribed Premises) (Scheduled Wastes Treatment and Disposal Facilities) Order, 1989.

The regulations specify the following requirements:

- Scheduled wastes shall as far as practicable, before disposal, be rendered innocuous;
- Generation of scheduled wastes shall be reduced using the best practicable means;
- Waste generators to notify the DOE of any scheduled wastes generated and keep up-to-date inventory of scheduled wastes generated, treated and disposed of;
- Scheduled wastes may be stored, recovered and treated within the premises of a waste generator;
- Land farming, incineration, disposal, off-site recovery, off-site storage and off-site treatment shall only

be carried out at prescribed premises licensed by the DOE;

- Use of durable waste containers with clear labels. Storage of wastes shall be proper and adequate;
- Waste generators shall conform to the requirements of the consignment note system when transporting wastes to ensure it reaches the approved destination and are carried out by licenced transporter; and
- Waste generators shall provide information to a transporter regarding the nature of the wastes transported and action to be taken in case of accidents.

Waste segregation

It is the responsibility of nursing and clinical staff to ensure that segregation of clinical waste is carried out at source and that all clinical wastes are deposited only in yellow bags and sharps in sharp bins only.

All healthcare establishments in Malaysia shall adopt the following standard colour coding which is widely accepted:

Black: General wastes

Yellow: Clinical wastes for incineration only

Light blue: Wastes for autoclaving or equivalent treatment before ultimate disposal

Clinical waste requiring autoclaving, or other equivalent treatment, before disposal shall be stored in light blue autoclave bags before such treatment but should be placed in yellow plastics bags after treatment.

Containers/bags in these colours shall only be used for the disposal of clinical waste and not for the transportation of other items, such as heavily contaminated linen to the laundry. Care should be taken to avoid confusion with other sorting systems which may use colour coding for identification, such as a laundry system.

Labelling and marking

All bags and drum containers must be identified at the point of production and should be indelibly and clearly marked with biohazard symbol.

Labelling can be done in a number of ways:

- Writing the information on the bag or container;
- Using pre-printed tape;
- Using pre-printed self-adhesive address labels supplied on a peel-off roll;
- Tie-on tag label, with information written on them; and
- Self-locking plastic tags, pre-printed with all the required information.

Handling, storage and internal transportation

At all times where manual handling of yellow clinical waste bags is required, the necks of the bags should be positioned to allow access for further movement of the bags when necessary. Manual handling of waste bags should be minimized wherever possible.

All clinical waste bags should be handled by the neck only.

Specific areas for the initial storage of clinical wastes, in the wards and departments shall be made available and located adjacent to the source of the waste. The bags and containers containing clinical wastes from the initial storage area shall be removed regularly.

Double yellow bags shall be used for clinical wastes from high risk areas such as infectious disease and isolation nursing units and for heavy clinical wastes such as placenta from labour rooms and human tissues from operating theatres.

Syringes with attached needles shall be discarded into sharps containers as one unit.

Internal transport routes (from wards/departments to central storage area) shall be designed to minimize the passage of waste through patient care areas and other clean areas.

Dedicated wheeled containers, trolleys or carts shall be used to transport the waste containers to the main storage area. These vehicles shall be reserved only for the transportation of clinical waste. They should be thoroughly cleaned and disinfected immediately following any spillage or accidental discharge.

Wheeled containers, trolleys or carts for transferring clinical wastes within hospitals shall be designed and constructed so that:

Special Feature : Hazardous Waste Management

- The surfaces of the wheeled containers, trolleys or carts are smooth and impermeable;
- They do not offer harbourage to insects and vermin;
- Particles of waste are not easily trapped on edges or crevices;
- They should contain any leakage from damaged containers;
- They can easily be cleaned, disinfected and drained; and
- The waste may be easily loaded, secured and unloaded.

Central storage

Central clinical waste storage areas should be covered and located at a site so as to minimize the movement of waste in the open from initial storage areas.

The central storage area must be:

- Located separately from the general waste storage areas and should be clearly identifiable (with clear warning signs) as for clinical wastes only and away from food preparation, public access and egress routes. Landfill and incinerable wastes should not be mixed;
- Locked when access is not required and should be accessible only to authorized persons;
- Well ventilated and well lit; and
- Located on well-drained, impervious hard-standing;

Facilities for washing down and disinfection of the central clinical wastes storage area, waste containers and trolleys used for transporting wastes, should be provided adjacent to the central storage area. All waste from cleaning process should be discharged to the foul sewer.

Sufficient storage capacity should be provided to allow for the proposed frequency of collection. Wherever possible, clinical wastes should be removed daily from the central storage area for disposal.

Refrigerated storage areas/units for clinical wastes should be considered where wastes have to be stored in bulk up to 48 hours prior to collection for disposal.

Transportation of clinical waste

The transportation of clinical waste from a central storage area to an approved facility requires the use of dedicated vehicles.

The vehicle shall be thoroughly cleaned and disinfected immediately following any internal spillage. The cleaning should be carried out on a proper surfaced area with the drainage running to the foul sewer.

Spill or accidental discharge

For healthcare establishments, spills of clinical wastes or materials are probably the most common emergencies related to hazardous material. Basically, the same response procedures are applied, regardless of whether the spills are from material or waste. The response to emergencies should ensure the following:

- The waste management plan should be followed;
- Contaminated areas should be cleared and if necessary disinfected;
- The exposure of workers should be limited as much as possible during the operation; and
- The impact on the environment should be limited to the best extent possible.

The staff should be well prepared for emergency response and the required equipment should be easily available at all points in time and within reasonable distance to ensure that adequate response can be carried out safely and routinely. There should be written procedures for the different types of emergencies. For dangerous spills, clean up

should be carried out by designated, specifically trained personnel.

Documentation

Proper documentation and record of the generation and handling of clinical waste is important in order to comply with the Environmental Quality (Scheduled Wastes) Regulations 1989, which require an inventory to be kept and a consignment note system to be used for the transport of waste from the hospital to an approved facility.

The consignment note captures the details of the waste generator (hospitals or clinics), the transport contractor and the final receiver (licensed facility) together with the information on the clinical waste being transported.

An inventory provides an accurate and up-to-date record of the quantities and categories of clinical wastes being generated, treated and disposed of.

These records should be retained by the respective parties for a period of three years.

Acknowledgment

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