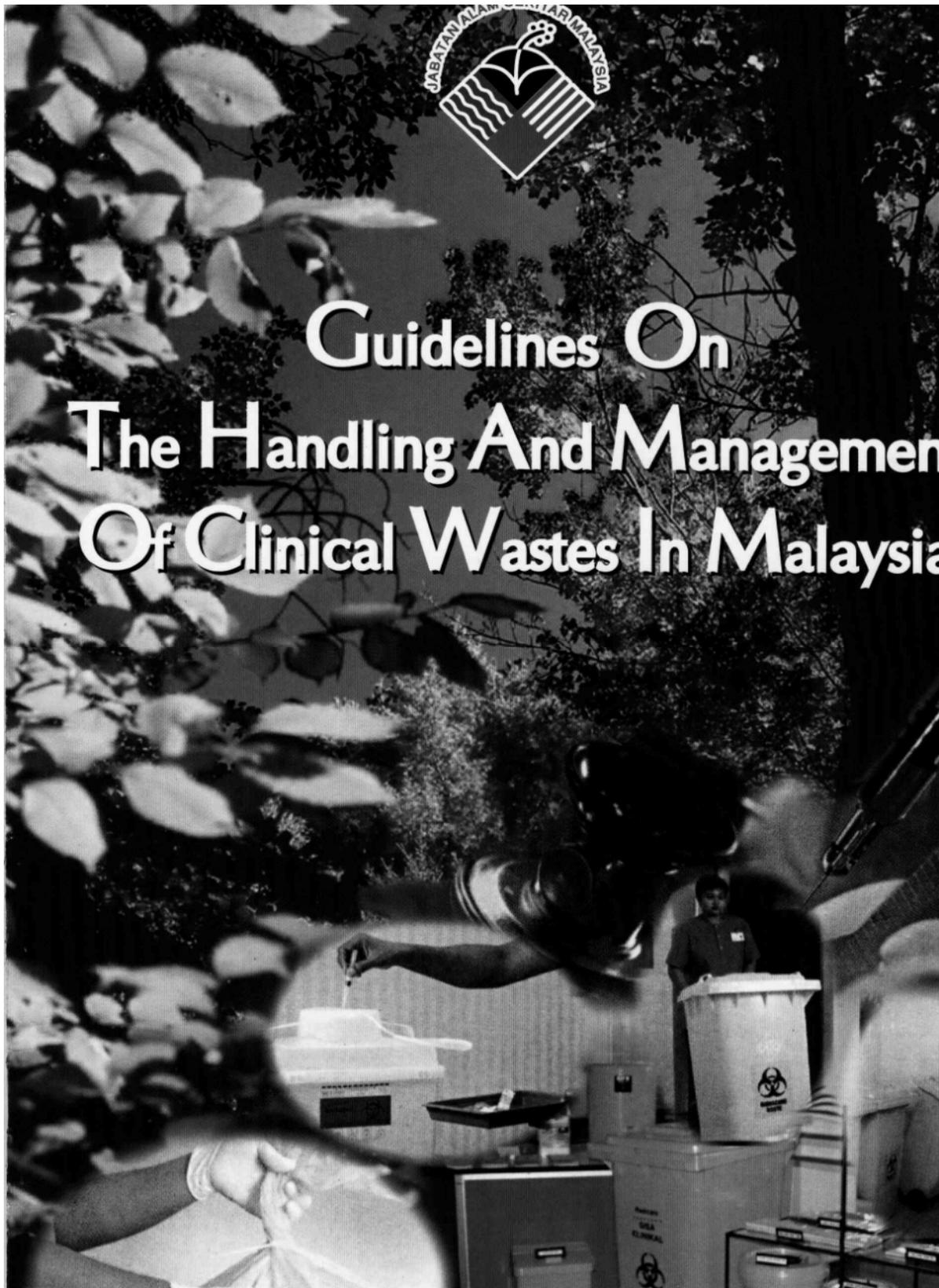




Guidelines On The Handling And Management Of Clinical Wastes In Malaysia



**DEPARTMENT OF ENVIRONMENT
MINISTRY OF NATURAL RESOURCES & ENVIRONMENT
LEVEL 1 – 4, PODIUM BLOCK 2 & 3,
LOT 4G3, PRECINCT 4,
FEDERAL GOVERNMENT ADMINISTRATIVE CENTRE
62574 PUTRAJAYA
TEL : 03 8871 2000
FAX : 03 8888 9987/8888 6120
HOMEPAGE : <http://www.doe.gov.my>**

THIRD EDITION, xxxx 2009

FOREWORD

The appropriate handling and disposal of clinical wastes generated from hospitals and other health care institutions and facilities is essential in order to mitigate against adverse health and environmental consequences. Health care services while important in ensuring better health inevitably create waste that may itself be hazardous to health as it may contain infectious and contaminated human tissues, blood, body fluids, excretions drugs, needles and other related materials. The immediate and long -term environmental health problems caused by improper management of clinical wastes are harmful to both public health and the environment.

In Malaysia, this concern has resulted in clinical waste being classified as scheduled waste that is controlled under the Environmental Quality (Scheduled Wastes) Regulations, 2005. This is in line with the international classification of clinical and related wastes arising from medical, nursing, dental, veterinary, or similar practices. In the course of implementing the scheduled wastes regulations, clinical waste generator may refer to these guidelines for the handling and management of clinical wastes to assist them to comply with the requirements of the Environmental Quality (Scheduled Wastes) Regulations, 2005. Besides complying with the regulations, more positive contribution could be given by the public and private sectors in reducing waste generation by enhancing the knowledge of all key players involved in clinical waste management, dissemination of technical and scientific information and promotion upgrading of existing infra-structural facilities and promotion of research on the impacts and risks of clinical waste on human health and the environment.

The guidelines have been prepared in close consultation and cooperation between the Department of Environment and the Engineering Division of the Ministry of Health Malaysia. The positive collaboration of both agencies will continue for the betterment of health and environmental quality of the country.



Dato' Hajah Rosnani Ibarahim
Director General
Department of Environment, Malaysia

Content

- ✓ Introduction
- ✓ Definition
- ✓ Identification, Classification and Waste Group
- ✓ Field of Application/Source Identification
- ✓ Hazardous Waste Legislation
- ✓ Waste Segregation
- ✓ Labelling and Marking
- ✓ Handling, Storage and Internal Transportation
- ✓ Central Storage
- ✓ Transportation of Clinical Waste
- ✓ Spill or Accidental Discharge
- ✓ Documentation
- ✓ Annexes
- ✓ Bibliography
- ✓ Acknowledgment

1. INTRODUCTION

- 1.1 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.
- 1.2 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.
- 1.3 These guidelines have also included the safety and health features in clinical waste management recommended by the Ministry of Health, Malaysia in order to protect health of staff, waste collection workers, patients and the general public.
- 1.4 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.
- 1.5 The growing concern over the need for a proper management of clinical waste in Malaysia has prompted the Government to establish comprehensive clinical waste collection, transportation and disposal system for all the Government hospitals through a privatisation program. Private healthcare establishments are likewise required 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.

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

- generation and minimisation;
- source separation and segregation;
- identification and labeling;
- 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.

2. DEFINITION

2.1 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:-

i. 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.

ii. Healthcare wastes

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

iii. Hazardous healthcare wastes

Biological (recognisable anatomical waste) and pathological waste, chemical, toxic or pharmaceutical waste including cytotoxic drug; (anti-neoplastics), sharps (e.g. needles, scalpels) and radioactive waste.

iv. Infectious healthcare wastes

All healthcare waste known or clinically assessed by a medical practitioner or veterinary/surgeon to have the potential 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).

v. 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 categorized as infectious waste.

3. IDENTIFICATION, CLASSIFICATION AND WASTE GROUP

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

- i. Clinical waste;
- ii. Radioactive waste;
- iii. Chemical waste;
- iv. Pressurized containers; and
- v. General waste.

3.2 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;
- Waste unless rendered safe may prove hazardous to any person coming into contact with it.

3.3 In Malaysia, clinical waste is classified as scheduled waste under the Environmental Quality (Scheduled Wastes) Regulations, 2005 which includes:-

- i. SW403 - Discarded drugs containing psychotropic substances or containing substances that are toxic, harmful, carcinogenic, mutagenic or teratogenic;
- ii. SW404 - Pathogenic and clinical wastes and quarantined

materials;

iii. SW421 - A mixture of scheduled wastes;

iv. SW422 - A mixture of scheduled and non scheduled wastes.

Presently, the following wastes have been included as scheduled wastes in the above regulations:

- Discarded drugs containing psychotropic substances or dangerous drugs;
- Waste from the preparation and production of pharmaceutical product and discarded drugs containing substances that are toxic, harmful, carcinogenic, mutagenic or teratogenic; and
- Waste containing one or more hazardous substances or products that are explosive, oxidising, flammable, toxic, harmful, corrosive, irritant, carcinogenic, teratogenic or mutagenic.

3.4 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.

3.5 The following classification is based on the major classification of clinical waste, but specified for practical use in the healthcare sector. Therefore, waste from health care establishment is classified in the following groups: -

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

Description	Waste management guidance
<p>1. Blood and body fluid waste</p> <ul style="list-style-type: none"> i. Soiled surgical dressings, e.g. cottonwool, 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. ii. Material other than reusable linen, from cases of infectious diseases (e.g. human biopsy materials, blood, urine, stools) 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 	<p>Special requirement on the management from the viewpoint of infection prevention. These categories of waste must always be incinerated completely in an appropriate incinerator.</p>

<p>swabs and dressings.</p>	
<p>2. 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 container; must be puncture resistant and leak tight.</p> <p>This category of waste has to be disposed/ destroyed completely as to prevent potential risk of injury / infection</p>
<p>3. 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 view point of infection prevention.</p> <p>This category of waste must always be incinerated completely in an appropriate incinerator.</p>
<p>4. 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 	<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>packaging has been opened or the ready-to-use preparation prepared by the user; or</p> <ul style="list-style-type: none"> • 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 II - pharmaceuticals which pose a potential hazard when used improperly by unauthorised persons: managed in an appropriate waste disposal facility.</p> <p>Class III - Heavy metal- containing unidentifiable pharmaceuticals: managed in an appropriate waste disposal facility.</p> <p>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>5. 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 iners, urine containers, incontinence pads and stoma bags.</p>	<p>Disposed of in a hazardous waste incineration plant licenced by the Department of Environment.</p>

4. FIELD OF APPLICATION / SOURCE IDENTIFICATION

4.1 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
- General hospitals

MEDIUM SOURCE

- Medical centres
- Out-patient clinics
- Mortuary/autopsy facilities
- Farm and equine centers
- Hospices
- Medical laboratories
- Medical research facilities
- Animal hospitals
- Blood banks and transfusion centres
- 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
- Cosmetic piercers

5. HAZARDOUS WASTE LEGISLATION

5.1 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 since May 1989:

- Environmental Quality (Scheduled Wastes) Regulations, 2005 (to replaced the 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;

5.2 The regulations among other things 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 waste generated, treated and disposed of (refer to Annexes 1 and 2);

- Scheduled wastes may be stored, recovered and treated within the premises of a waste generator;
- , Incineration, disposal, , 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 licensed transporter (refer to Annex 3). Effective from 1st January 2007, 'e-Consignment Note' web application come into operation and as such, the consignment note can be sent electronically to DOE. Waste generator, contractor and waste receiver of scheduled wastes are requested to use this system for every transaction of waste. This system can be accessed through <http://eswiss.jas.sains.my> or through the DOE portal at www.doe.gov.my; 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 (refer to Annex 4).

6. WASTE SEGREGATION

6.1 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.

6.2 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

- 6.3 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.
- 6.4 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 or identification, such as a laundry system.

7. LABELLING AND MARKING

- 7.1 All bags and drum containers must be identified at the point of production and should be indelibly and clearly marked with biohazard symbol (Annex 5).
- 7.2 For storing of waste in container, appropriate label as shown in Annex 6 should be pasted onto the container. The date when the scheduled wastes are first generated, name, address and telephone number of the waste generator shall be included in the label.
- 7.3 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;
 - Self-locking plastic tags, pre-printed with all the required information.

8. HANDLING, STORAGE AND INTERNAL TRANSPORTATION

- 8.1 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.
- 8.2 All clinical waste bags should be handled by the neck only.
- 8.3 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.
- 8.4 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.
- 8.5 Syringes with attached needles shall be discarded into sharps containers as one unit.
- 8.6 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.
- 8.7 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.

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

- 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;
- The waste may be easily loaded, secured and unloaded.

9. CENTRAL STORAGE

9.1 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.

9.2 The central storage area must be:-

- i. 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 route. Landfill and incinerable wastes should not be mixed;
- ii. Locked when access is not required and should be accessible only to authorized persons;
- iii. Well ventilated and well lit;
- iv. Located on well drained, impervious hard-standing.

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

9.4 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.

9.5 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. The temperature of the refrigerated storage areas/unit should be kept at 4 °C to 6°C.

10. TRANSPORTATION OF CLINICAL WASTE

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

10.2 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.

11. SPILL OR ACCIDENTAL DISCHARGE

11.1 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;
- The impact on the environment should be limited to the best extent possible.

11.2 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.

12. DOCUMENTATION

- 12.1 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 2005, which require an inventory be kept and a consignment note system to be used for the transport waste from the hospital to an approved facility.
- 12.2 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.
- 12.3 An inventory provides an accurate and up-to-date record of the quantities and categories of clinical wastes being generated, treated and disposed of.
- 12.4 These records should be retained by the respective parties for a period of three years.

NOTIFICATION OF SCHEDULED WASTES (Two copies to be completed)

For office use File reference No.....
--

1. IDENTIFICATION

Waste generator code :

State Code :

- i. Name and Address of Premise:.....

 Tel. No: Fax No..... Telex :
- ii. Owner of Premise:.....
 Designation:.....;

2. PRODUCTION DATA

(i) List of raw materials/chemicals and quantities used per month*

Raw Material/Chemicals	Quantity (Metric Tonnes)
.....
.....
.....

(ii) List of items and quantities used per month*

Production Items	Quantity
.....
.....
.....

3. WASTE DATA

(i) Scheduled wastes generated per month **

Waste Category Code	Name of Waste	Waste Component	Quantity (Metric Tonnes)
.....
.....
.....

(ii) Other Wastes generated per month **

Name of waste	Liquid/Solid/Sludge	Quantity (Metric Tonnes)
.....
.....
.....

Notes:

- * Use additional sheet if required
- ** Estimates

I certify that the information provided is true and correct to the best of my knowledge.

.....
Signature of Reporting Officer

Name;

Designation:.....

Date:.....

I/C No:.....

INVENTORY OF SCHEDULED WASTE

Date	Waste Category	Name of Waste	Quantity Generated (metric tonnes)	Waste Handling		
				Method	Quantity in metric tonnes	Place**

Note:

* Store, process, recover, incinerate, exchange or other methods (state)

** Give name and address of the facility

CONSIGNMENT NOTE FOR SCHEDULED WASTES

I WASTE GENERATOR

Waste generator /
code :

State Code:

Name of Waste Generator:.....

Address:.....

Name of Responsible Person :.....

Tel. No.:Fax. No. :Telex No.....

Name of Waste : Waste Category Code :

Waste Component:

Waste Origin : Waste Origin Code:

Type of Waste :

Solid sludge liquid

Waste Packaging:

Pallet Canister 55 gal. Drum Other

Container

(Specify).....

Quantity : And If Possible

Metric tones

m³

Cost of treatment and Disposal \$/ Metric tonne

Name and Address of Final Destination :

Delivery date:

Signature of Responsible Person

.....

INFORMATION**A. Properties**

1. Category of waste
 - according to the First Schedule
2. Origin
 - State from which process, activity, occurrence, etc. the waste is generated
3. Physical properties of waste
 - a) Flashpoint °C
 - b) Boiling point °C
 - c) Consistency at room temperature (gas, liquid, sludge, solid)
 - d) Vapours lighter/heavier than air
 - e) Solubility in water
 - f) Waste lighter/heavier than water
1. Risks
 - by inhalation
 - by oral intake
 - by dermal contact

B. Handling of Waste

1. Personal protection equipment
 - Gloves, goggles, face shield etc.
2. Procedures/Precautions in handling, packaging transporting and storage
3. Appropriate label
 - Labels for the containers
4. Recommended Method of Disposal

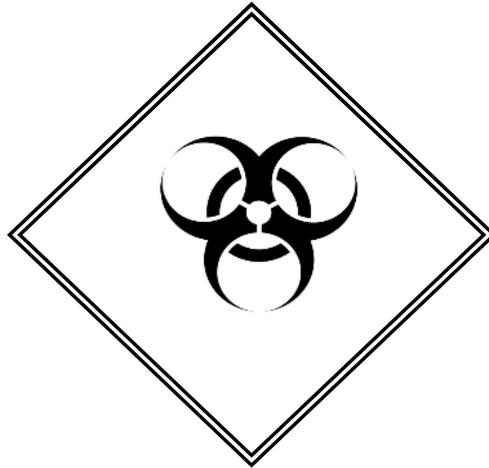
C. Precautions in case of spill or accidental discharge causing personal injury

1. In case of inhalation of fumes or oral intake
 - Symptoms of intoxication
 - Appropriate first aid Guidelines for the physician
2. In case of dermal contact or contact with eyes
 - Symptoms of intoxication
 - Appropriate first aid
 - Guideline for the physician

D. Steps to be taken in case of spill or accidental discharge causing material damage arising from

1. Spill on floor, soil, road etc.
2. Spill into water
3. Fire
4. Explosion

Biohazard Symbol



INFECTIOUS SUBSTANCES (WASTE)

Symbol (three crescents superimposed on circle) : black Background : White



Waste code :

Waste name :

Date generated :

Waste generator :

Address and
telephone number :

BIBLIOGRAPHY

1. Basel Convention-Technical Guideline on the Environmentally Sound Management of Biomedical and Healthcare Waste
2. Environmental Quality (Scheduled Wastes) Regulations, 1989
3. Ministry of Health Malaysia, Management of Clinical and Related Waste in Hospital and Health Care Establishments, 1993

ACKNOWLEDGEMENT

These guidelines were prepared in close consultation and cooperation between the Department of Environment and the Ministry of Health, Malaysia.

Acknowledgement and with gratitude the contribution and involvement of the Hazardous Substances Division of Department of Environment and the Engineering Division of Ministry of Health.