



HEALTH PROFESSIONS COUNCIL OF SOUTH AFRICA

GUIDELINES FOR GOOD PRACTICE IN THE HEALTH CARE PROFESSIONS

GUIDELINES FOR THE MANAGEMENT OF HEALTH CARE WASTE

BOOKLET 12

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THE SPIRIT OF PROFESSIONAL GUIDELINES

Practice as a health care professional is based upon a relationship of mutual trust between patients and health care practitioners. The term "profession" means "a dedication, promise or commitment publicly made".¹ To be a good health care practitioner, requires a life-long commitment to sound professional and ethical practices and an overriding dedication to the interests of one's fellow human beings and society. In essence, practice as a health care professional is a moral enterprise. In this spirit the HPCSA presents the following ethical guidelines to guide and direct the practice of health care practitioners. These guidelines form an integral part of the standards of professional conduct against which a complaint of professional misconduct will be evaluated.

[Note: The term "health care practitioner" in these guidelines refers to persons registered with the HPCSA].

¹ Pellegrino, ED. Medical professionalism: Can it, should it survive? *J Am Board Fam Pract* 2000; 13(2):147-149 (quotation on p. 148).

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GUIDELINES FOR THE MANAGEMENT OF HEALTH CARE WASTE BY HEALTH CARE PRACTITIONERS

1 MOTIVATION OF THE NEED FOR THESE GUIDELINES

The HPCSA views the proper disposal of health care waste by health care practitioners as an essential element of good professional practice. These guidelines are issued to remind practitioners of their ethical and professional obligations to their patients and to the community. They also serve to assist practitioners to meet the HPCSA's mandate to protect the public and the requirements of the South African Constitution (Act No.108 of 1996) regarding the preservation and protection of the environment.

2 DEFINITION OF HEALTH CARE WASTE

Health care waste may be defined as any undesirable or superfluous by-product, emission, residue or remainder generated by in the course of health care by healthcare professionals, healthcare facilities and other non-healthcare professionals, which is discarded, accumulated and stored with the purpose of eventually discarding it, or is stored with the purpose of recycling, re-using or extracting a usable product from such matter. Health care waste may, if handled improperly, have the potential to harm people, property or the environment. In this regard, all human anatomical waste, blood and body fluids are considered to be potentially hazardous. The unsafe disposal of such waste could have detrimental effects for people who might come into contact with health care waste.

3 TYPES OF HAZARDOUS HEALTH CARE WASTE

For the purpose of these guidelines, the following would be considered to be hazardous health care waste:

- 3.1 Infectious waste.
- 3.2 Pathological waste, including body fluids, secretions and surgical specimens.
- 3.3 Sharps, especially contaminated sharps.
- 3.4 Pharmaceutical waste.
- 3.5 Chemical waste.
- 3.6 Heavy metals.
- 3.7 Radioactive waste.
- 3.8 Genotoxic waste.
- 3.9 Cytotoxic agents
- 3.10 Pressurised containers.

4 HAZARDOUS PROPERTIES OF HEALTH CARE WASTE

Health care waste may be hazardous because it contains infectious, radioactive or toxic (including genotoxic, immunotoxic and cytotoxic) materials. Health care waste may also contain hazardous chemicals or pharmaceuticals and could be responsible for traumatic injury and other forms of physical hazard.

5 REASONS WHY HEALTH CARE WASTE IS A SIGNIFICANT DANGER TO SOCIETY

Health care waste is a significant danger to society because:

- 5.1 Unsafe management of hazardous health care waste, particularly in its disposal, may increase the risk of needle stick injuries, transmission of infectious agents and expose unsuspecting parties to unnecessary and entirely preventable risks. The severity of the risk associated with such exposures may be difficult to quantify, and such exposures should be prevented.
- 5.2 Health care waste entering the normal domestic waste stream will end up being disposed of in municipal landfill sites. When health care waste is placed in landfills or buried, contamination of groundwater may occur and may result in the spread of E-Coli and unacceptably high COD readings.
- 5.3. Many smaller landfill sites are not fenced off and have poor security. This results in unwanted tip-face picking and scavenging. If health care waste is disposed on such a site, there is a risk of exposure to people scavenging on the sites.
- 5.4 The irresponsible and illegal dumping of hazardous health care waste in South Africa, as intermittently reported in the media, is a matter of serious concern. It also places an unacceptably high financial and human resources burden on health authorities to manage the problem.
- 5.5 The burning of health care waste as opposed to incineration is not recommended as it pollutes the environment, especially through the formation of dioxins. Incineration should only be used where it meets specifications that avoid secondary pollutant emissions.

6 MANAGEMENT OF HEALTH CARE WASTE BY HEALTH CARE PRACTITIONERS

- 6.1 It is the responsibility of all health care practitioners to have a health care waste management system in place or to have access to such a system. Such a system should be provided by an accredited waste service provider and be conducted in accordance with relevant SANS code, such as 10248 -1- 2008 as updated. Such a system should deal comprehensively with measures for waste minimization, segregation, packaging, labeling, storage and removal under circumstances that do not pose a threat to human health or the environment, both for routine circumstances and in the event of an accident resulting in contamination with health care waste.
- 6.2 Independent practitioners should be able to provide demonstrable evidence of compliance with an acceptable protocol for the management of health care waste. Such a protocol should provide for an audit trail of the management of waste generated by the practice.
- 6.3 Where a health care practitioner is in the employ of a health care institution and is not directly responsible for the management policies of the facility, there is an

obligation on practitioners to insist that the management comply with the provisions of these guidelines. Where management is unable or unwilling to meet the requirements for safe management of health care waste, the practitioner should report the matter to the HPCSA and the Department of Health for appropriate follow up.

- 6.4 Provincial and local government health authorities should, wherever possible, by mutual agreement and taking into account the cost implications, make their facilities for the management of health care waste available to independent health care practitioners in the area.
- 6.5 Where a health care practitioner is responsible for the management of a health care facility, he or she must ensure that the facility has a documented waste management policy with sufficient resources and suitably trained team members to implement safe management of health care waste generated by the facility and its staff.
- 6.6 Health care practitioners should aim at all times to minimize the amount of health care waste generated in the process of health care delivery and to ensure that they are familiar with methods to minimize, segregate and store health care waste safely.
- 6.7 It is the responsibility of health care practitioners to ensure that, if necessary, they should keep up to date with the latest scientific knowledge on the safe management of health care waste by undergoing further training in waste management.
- 6.8 All medical sharps should be considered hazardous healthcare waste whether or not contaminated with infectious agents. The proper use and disposal of suitable sharps containers contributes to the minimization of injuries and transmission of potentially harmful agents. It is important that the health care practitioner make use of sharp containers that are suited for the purposes of disposing of sharps. Such containers should not puncture easily, should be stable and durable enough to withstand a fall onto a hard surface.
- 6.9 When using sharps containers for discarded needles and other sharp health care waste, health care practitioners should ensure that the containers are not filled beyond their fill capacity, and are maintained upright throughout their use during handling, storage and transport. Sharps that contain cytotoxic, genotoxic or radioactive waste should be treated as per their waste categories and not mixed with general sharp items. Do not reuse sharps containers designed, manufactured and intended for single-use purposes.
- 6.10 Health care practitioners have an obligation to report evidence of unsafe disposal or management of health care waste by other persons, including any health care practitioners, to the HPCSA and the Department of Health, should such unsafe practice come to their attention.
- 6.11 The Code of Practice of the South Africa Bureau of Standards on the Handling and Disposal of Waste Material within Health Care Facilities (SANS 10248 -1- 2008) or updates, should it be amended, should be used as a supplement to these official guidelines of the HPCSA for the management of health care waste by health care practitioners (see Annexure below).
- 6.12 Failure to adhere to these guidelines will be considered to be unprofessional conduct on the part of the health care practitioners concerned.

7	CONTACT DETAILS OF AUTHORITIES WHERE FURTHER ADVICE MAY BE OBTAINED
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- | | |
|---|--|
| <p>7.1 The Director-General
 Department of Health
 Private Bag X828
 PRETORIA
 0001
 Tel: (012) 312-0921
 Fax: (012) 323-0094</p> | <p>7.7 Environmental Health Office
 Department of Health
 Private Bag X517
 BLOEMFONTEIN
 9300
 Tel: (051) 405-5021
 Fax: (051) 448-1150</p> |
| <p>7.2 Provincial Environmental Health Office
 Department of Health
 Private Bag X0038
 BISHO
 5609
 Tel: (040) 609-3701
 Fax: (040) 635-0115</p> | <p>7.8 Environmental Health Office
 Department of Health and Welfare
 Private Bag X2068
 MMABATHO
 2735
 Tel: (018) 387-5096
 Fax: (018) 387-5332</p> |
| <p>7.3 Environmental Health Office
 Department of Health
 Private Bag X11285
 NELSPRUIT
 1200
 Tel: (013) 752-8085 x 2043
 Fax: (013) 755-3549</p> | <p>7.9 Environmental Health Office
 Department of Health
 P O Box 62302
 MARSHALLTOWN
 2107
 Tel: (011) 355-3829
 Fax: (011) 355-3154</p> |
| <p>7.4 Environmental Health Office
 Department of Health
 Private Bag X9051
 PIETERMARITZBURG
 3201
 Tel: (033) 395-2772
 Fax: (033) 342-1405</p> | <p>7.10 Environmental Health Office
 Department of Health
 P O Box 648
 CAPE TOWN
 8000
 Tel: (021) 483-3737
 Fax: (021) 483-2786</p> |
| <p>7.5 Environmental Health Office
 Department of Welfare
 Private Bag X5048
 KIMBERLEY
 8300
 Tel: (053) 830-0654
 Fax: (053) 830-0655</p> | <p>7.11 The Director General
 Department of Environmental Affairs
 and Tourism
 Fedsure Forum
 315 Pretorius Street
 Private Bag X477
 PRETORIA
 0001</p> |
| <p>7.6 Environmental Health Office
 Department of Health and Welfare
 Private Bag X9302
 POLOKWANE
 0700
 Tel: (015) 290-9057
 Fax: (015) 291-2925</p> | <p>7.12 The President
 South African Institute of
 Environmental Health
 P O Box 23
 NIGEL
 1490</p> |

8	REFERENCES
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- 8.2 Mathee A. Environment and Health in South Africa: Gains, Losses and Opportunities. Journal of Public Health Policy. 2011. 32, s37- s43. DOI: 10.1057/jphp.2011.21
- 8.3 South African National Standards (A division of SABS): Management of healthcare waste. Part 1: Management of healthcare Risk Waste from a Healthcare facility. SANS Code 10248-1-2008, Pretoria. 2008.
- 8.4 Gabela, S D. Health Care Waste Management in Public Clinics in the ILembe District. A Situational Analysis and Intervention Strategy. Health Systems Trust, University of Kwazulu Natal. National Department of Health. 2007. <http://www.hst.org.za> [accessed on16 May 2015]
- 8.5 Oelofse, S & Musee, N. Hazardous Waste Management and Emerging Waste Streams: A Consideration of Key Emmerging Issues that may Impact the State of the Environment. CSIR, Natural Resources and the Environment. March 2008. ISBN No: 978-0-9814178-3-7

**I suggest we replace with SANS 10248-1-2008 with annexures
A.B, D & F**

ANNEXURE
ABRIDGED VERSION

UDC 725.5:628.4.04

SABS 0248:1993

SOUTH AFRICAN BUREAU OF STANDARDS

CODE OF PRACTICE

for the

**HANDLING AND DISPOSAL OF WASTE MATERIALS WITHIN HEALTH CARE
FACILITIES**

(Incorporating CAN/CSA-Z317.10-88, *Handling of waste materials within health care
facilities*, with modifications)

Abridged by the
Health Professions Council of South Africa
as part of the
Guidelines for the Management of Health Care Waste by Medical Practitioners, Dentists
and Medical Scientists

The detailed document is
obtainable from the

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NOTICE

The detailed standard was approved by the Council of the South African Bureau of Standards on 25 February 1993. It remains under revision and should, therefore, be obtained from the Bureau in full if required for verification of specific provisions.

NOTES

1. In terms of the Regulations promulgated under the Standards Act, 1982 (Act No. 30 of 1982), it is a punishable offence for any person to falsely claim compliance with the provisions of a code of practice published by the South African Bureau of Standards.
2. Authorities who wish to incorporate any part of this code of practice into any legislation in the manner intended by section 33 of the Act, should consult the South African Bureau of Standards regarding the implications.
3. As the standard will be revised when necessary in order to keep abreast of progress, comment will be welcomed by the Bureau and will be considered when the standard is revised.

FOREWORD

The standard establishes specific guidelines for the segregation, collection, movement and storage of waste materials within health care facilities. The main objective is to decrease injury to personnel and the possible risks of spreading infection due to the improper handling of waste materials.

The main features of the standard are as follows:

1. A series of waste categories based on the World Health Organisation's Report *Management of Waste from Hospitals* has been introduced.
2. A clause on pharmaceutical waste appears in the standard.
3. A classification system for waste containers has been developed.
4. Various procedures reflect modern current infection control practices.
5. The standard has been written in such a way as to reflect the practical aspects of handling waste.

INTRODUCTION

In many guidelines, all waste contaminated with blood or body fluids are classified as infectious waste. This enormously increases the volume of waste requiring expensive handling and disposal. Identical items of waste are disposed of from homes with no special handling or decontamination. For these reasons, this issue received detailed consideration during the preparation of the standard.

The identification of every patient who carries a blood borne pathogen such as Hepatitis B or Human Immunodeficiency Virus (HIV, leading to AIDS) is both impractical and inappropriate. The modern trend in hospital infection control is to build safe practices into ALL clinical procedures; the precaution taken is dictated by the risk accompanying the procedure, not by the diagnosis.

Two premises have been incorporated throughout the standard:

1. The simple presence of viable organisms does not constitute a hazard; a mechanism by which these organisms can infect a host must coexist. Since Hepatitis B and HIV are usually transmitted by inoculation, the concern with blood alone, for example, is misplaced. The emphasis should more appropriately be applied to the category of clinical sharps. Infections acquired by waste handlers are rare, but almost always associated with trauma. Vigorous efforts directed toward the prevention of these injuries deserve high priority; the incidence of both the wounds and accompanying infections can be reduced dramatically by adherence to safe procedures.
2. Absolute elimination of all risk is impossible. A realistic goal is the attainment of a reasonable degree of safety at all times without needlessly compromising efficiency.

Note: The scope of the standard is restricted to the health care site, but the responsible person for the health care facility still bears the ultimate responsibility for the safe disposal of waste (generated on site) outside the site.

1 SCOPE AND FIELD OF APPLICATION

- 1.1 The standard includes criteria for the segregation, collection, movement, storage, and on-site disposal of waste materials within health care and biological research facilities.
- 1.2 The standard does not deal with the disposal of waste once it has been removed from the site of the health care facility. Such matters are the subject of national, provincial, regional and municipal legislation and regulations.
- 1.3 The standard does not address special precautions in national and provincial legislation which may apply to infectious substances (or the transportation thereof).
- 1.4 In the standard, "shall" indicates a mandatory requirement; "should" indicates a recommendation, or that which is advised but not mandatory.
- 1.5 Notes accompanying the clauses do not include mandatory or alternative requirements. The purpose of a note accompanying a clause is to separate it from the text as being explanatory or informative material that is not properly a part of the standard. Notes to the table are considered to be part of the table and are written as mandatory requirements.

2 DEFINITIONS

The following definitions apply to the standard and are included herein for information and clarity:

- 2.1 **Chemical waste:** Comprises discarded solid, liquid and gaseous chemicals, e.g. from diagnostic or experiential work, or from cleaning, housekeeping or disinfecting procedures. Chemical waste may be hazardous or non-hazardous. For the purposes of choosing the most appropriate waste-handling method, hazardous chemical waste is considered to be waste that is -
 - 2.1.1 Toxic;
 - 2.1.2 Corrosive (acids of pH < 2,0 and bases of pH > 12,0);

2.1.3 Flammable;

2.2.4 Reactive (explosive, water reactive, shock sensitive); or

2.2.5 Genotoxic (carcinogenic, mutagenic, teratogenic or otherwise capable of altering genetic material).

[Note: Non-hazardous chemical waste consists of chemicals other than those described here, such as sugars, amino acids, and certain organic and inorganic salts].

2.2 **Clinical glass:** Glass possibly contaminated with blood and body fluids or chemicals, (e.g. blood collection tubes, laboratory glass, medication vials).

2.3 **Collection:** The accumulation of wastes from several primary or intermediate storage sites for movement to a waste-holding area or from several waste-holding areas for movement to a final storage area.

2.4 **Colour-coding:** The application of colour to a container in order to identify the category of waste for which it is to be used.

2.5 **Container:** Any receptacle for the storage of wastes. Containers can be classified into two subgroups as follows:

2.5.1 Reusable waste container.

2.5.2 Single-use waste container.

2.5.1. **Reusable waste container:** A waste container that is:

2.5.1.1 Reusable;

2.5.1.2 Fabricated of metal or rigid plastics;

2.5.1.3 Resistant to burning, impact and corrosion;

2.5.1.4 Suitable for the waste it is to contain; and

2.5.1.4 Colour-coded or identified according to the type of waste for which it is intended (see table 1) by one of the following methods:

1. If the container is made of plastics, the plastics may be dyed in the appropriate colour; or
2. A band of colour not less than 50 mm in width may be applied to the container. Reusable waste containers shall be inspected for holes or leaks every time they are emptied, and their colour-coding renewed if necessary.

[Note: Such containers are used for the:

- a. Collection;
- b. Transportation; or
- c. Storage of waste, e.g. garbage cans and storage bins].

2.5.2 **Single-use waste container:** A waste container that can be one of the following:

2.5.2.1 Sharps container.

2.5.2.2 Waste-holding plastic bag.

2.5.2.3 Cardboard container.

2.5.2.4 Specialised container.

2.5.3 **Sharps container:** A container that:

2.5.3.1 Is sturdy enough to resist puncture under usage conditions and to the point of disposal;

2.5.3.2 Is clearly identified as containing sharps, e.g. by the use of the word SHARPS or a symbol recognised by the facility;

2.5.3.4 Has lid(s) capable of being tightly secured; and

2.5.3.5 If used for containing cytotoxic wastes, has the cytotoxic hazard symbol displayed clearly and visibly.

[Notes:

1. Other useful features of sharps containers include -

- a. A fill line;
- b. Unauthorised withdrawal prevention;
- c. Handles; and
- d. A wall bracket and lock.

2. Containers selected should be compatible with and appropriate to the type of waste they are to contain.

3. Where practical, the same type of container should be used throughout a facility. Standardisation of the containers will encourage greater use and enhance identifiability among users].

2.5.4 **Waste-holding plastic bag container:** A plastics bag used as a container and that is:

2.5.4.1 Colour-coded or identified according to the type of waste for which it is intended (see table 1); and

2.5.4.2 Sturdy enough to resist puncture, leaking and breaking under individual usage conditions and to the point of disposal, except where:

- a. Provincial regulations governing the off-site disposal of waste require bags of a specific thickness;
- b. Municipal or other local authorities responsible for sanitary landfill sites require bags of a specific thickness; or
- c. Facility administrators have established procedures involving specified bag thicknesses.

[Note: It is inappropriate to specify a minimum thickness of plastic bags or plastic sharps containers since polymeric materials vary extensively in their physical and mechanical properties. It is quite possible that a 25 mm thick film of one polymeric material will be more puncture, impact and abrasion resistant than a 50 mm thick film of a different polymeric material. These properties can be further affected by the manufacturing process, i.e. extrusion and injection moulding. The most appropriate manner of determining the suitability of a particular container in respect of its ability to resist puncture, leaking and breaking under individual usage conditions is to subject the container to those usage conditions].

2.5.5 Cardboard container: A container made from cardboard and that is:

2.5.5.1 Colour-coded or identified according to the type of waste for which it is intended (see table 1);

2.5.5.2 Rigid; and

2.5.5.3 Leak resistant.

2.5.6 Specialised containers (e.g. paint cans): Specialised containers colour-coded or identified according to the type of waste for which they are intended.

2.6 Cytotoxic: Having a deleterious effect upon cells; commonly used in reference to pharmaceuticals used in the treatment of cancer, (e.g. antineoplastics, chemotherapy agents).

2.7 Disposal: The removal of waste from the site of the health care facility or the on-site incineration of waste.

2.8 General waste: Waste that:

2.8.1 Has not been included in the other waste categories; and

2.8.2 Does not pose a disease-related risk or threat to people or the environment.
The general waste category includes:

2.8.2.1 Office waste;

2.8.2.2 Kitchen waste;

2.8.2.3 Non-clinical glass waste; and

2.8.2.4 All other similar wastes.

2.9 Hazardous: Referring to any material or substance that, if handled improperly, has the potential to harm people, property or the environment.

[Note: All human anatomical waste such as blood and body fluids are potentially hazardous.

2.10 Human/animal anatomical waste:

2.10.1 Waste consisting of:

2.10.1.1 Tissues;

2.10.1.2 Organs;

- 2.10.1.3 Body parts;
- 2.10.1.4 Products of conception; and
- 2.10.1.5 Animal carcasses.

2.10.2 This waste category is divided into the subcategories of:

- 2.10.2.1 Human anatomical waste;
- 2.10.2.2 Infectious animal anatomical waste; or
- 2.10.2.3 Non-infectious animal anatomical waste.

[Note: The following are considered to be non-anatomical wastes:

- a. Blood and body fluids.
- b. Extracted teeth.
- c. Nail clippings.
- d. Hair].

2.11 **Health care facilities:** Health care facilities are all places (sites) where professional health services are dispensed to human patients or biological research is carried out and includes, *inter alia*, hospitals, clinics, rehabilitation centres, sick bays (old age homes), free-standing operating theatres, day units, clinics (mobile and stationary) and doctor's consulting rooms.

2.12 **Infectious non-anatomical waste:** Any waste contaminated with viable micro-organisms capable of transmitting, and reasonably likely to transmit, disease.

[Note: This may include -

- a. All microbiology lab wastes that have not been decontaminated;
- b. Waste from surgeries and autopsies performed on patients with infectious diseases; and
- c. All contaminated waste from patients].

2.13 **Movement:** Transfer of waste material between storage areas within the health care facility.

2.14 **Non-clinical glass:** Glass from maintenance and kitchen areas, (e.g. broken window panes and discarded glass bottles, unless visibly contaminated with blood).

2.15 **Pharmaceutical waste:** Pharmaceutical products such as drugs and medicinal chemicals that are:

- 2.15.1 No longer usable in patient treatment and have been returned from patient care areas, have become outdated or contaminated, have been stored improper; or

- 2.15.2 No longer required.
- 2.16 **Pressurised container waste:** Consists of aerosol cans or disposable compressed gas containers that may explode if incinerated or accidentally punctured.
- 2.17 **Refrigerated storage:** Storage of waste at a temperature of 4°C or lower.
- 2.18 **Segregation:** The separation of waste according to classification (see Table 1) prior to storage.
- 2.19 **Sharps and similar waste:** These include:
- 2.19.1 Needles;
 - 2.19.2 Syringes;
 - 2.19.3 Blades;
 - 2.19.4 Clinical glass; and
 - 2.19.5 Any other clinical items capable of causing a cut or puncture.
- 2.20 **Soiled utility room:** An intermediate storage room within the facility where waste from the patient's bedside is temporarily stored.
- 2.21 **Storage:** The accumulation of waste after segregation in a specified container in a predetermined location.
- 2.22 **Storage areas:**
- 2.22.1 **Final storage area:** The area of the facility where waste is stored just before being disposed of;
 - 2.22.2 **Intermediate storage area:** The area of the facility where waste is stored following its collection from the primary storage area and before being removed to the final storage area. This will necessarily include the means by which the waste is transported;
 - 2.22.3 **primary storage area:** The area of the facility where waste originates, e.g. a consulting room, patient room and laboratory.
- 2.23 **System:** The waste management system belonging to the health care facility.
- 2.24 **Waste holding:** The storage of waste collected from all primary storage areas such as a laboratory wing, a block of operating rooms, or a floor of patient rooms.

3	REFERENCE DOCUMENTS
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- 3.1 The following documents should be referred to when handling and disposing of waste materials:
- 3.1.1 *Medicines and Related Substances Control Act, 1965* (Act No. 101 of 1965).

- 3.1.2. *Human Tissue Act*, 1983 (Act No. 56 of 1983), as amended.
- 3.1.3 Compulsory specification for biological safety cabinets (Classes I, II and III), published by Government Notice No. 1318 (*Government Gazette* No. 12517) of 15 June 1990.
- 3.1.4 SABS 1186, *Symbolic safety signs*.
- 3.1.5 SABS 0226, *The installation, post-installation tests and maintenance of biological safety cabinets*.
- 3.1.6 BS 5252, *Framework for colour coordination for building purposes*.

4**OCCUPATIONAL HAZARDS AND HEALTH RISKS**

- 4.1 To minimise the occupational health risks associated with the handling and disposal of health care waste, occupational health care programmes should:
 - 4.1.1 Introduce safe or less hazardous substitutes for chemical agents with exposure hazards;
 - 4.1.2 Require closed storage for volatile agents, traces of which, or brief exposure to which, cause a health hazard;
 - 4.1.3 Require the use of proper venting and exhausting in accordance with the established principles of occupational hygiene;
 - 4.1.4 Provide appropriate personal protective equipment with disinfection and disposal arrangements for workers involved in various stages of waste handling and disposal;
 - 4.1.5 Include an assessment of waste management procedures on a regular basis, to assure compliance with the standard and applicable national, provincial, regional and municipal regulations and legislation;
 - 4.1.6 Include a training programme for all persons handling wastes;
 - 4.1.7 Include appropriate protective equipment and handwashing facilities; and
 - 4.1.8 Include a written procedure to handle and report needle-stick injuries and other injuries sustained whilst engaged in waste disposal.
- 4.2 Health care facilities shall have freely available to all personnel concerned, written policies and procedures which include requirements for at least:
 - 4.2.1 The cautionary labeling of all containers of hazardous materials;
 - 4.2.2 Material safety data sheets;
 - 4.2.3 Appropriate worker training for each system element;
 - 4.2.4 Protection of proprietary information; and
 - 4.2.5 When applicable, compliance with relevant national and local regulations.

5 GENERAL PROVISIONS

All waste needs to be handled so as to ensure that it is segregated at source, contained in packaging that holds the contents to the point of disposal, and disposed of in a manner that is practical and efficient yet minimises any hazard. By minimising the handling of waste, fewer people will be exposed to it. Potentially offensive unrefrigerated waste should be timeously removed.

There are certain classes of waste that need to be handled in specific ways. They are specified in the standard to ensure proper handling.

5.1 SEGREGATION OF WASTES

Wastes shall be segregated according to the following categories that are further detailed in Table 1 (see below page 16):

- 5.1.1 Human/animal anatomical waste.
- 5.1.2 Infectious non-anatomical waste.
- 5.1.3 Sharps and similar waste.
- 5.1.4 Chemical/pharmaceutical waste.
- 5.1.5 Radioactive waste.
- 5.1.6 Pressurised container waste.
- 5.1.7 General waste.

5.2 IN-HOUSE CONTROL

- 5.2.1 Each generator of biohazardous waste shall prepare, maintain and implement a written plan to identify and handle all waste generated within the facility and shall provide a training programme for all staff to familiarise them with:
 - 5.2.1.1 Procedures for the segregation, collection, storage, labeling and movement of waste specified by the standard;
 - 5.2.1.2 Personal hygiene, especially handwashing; and
 - 5.2.1.3 The hazards of those materials to which workers may be exposed. Such training shall be continuously assessed and reinforced.
- 5.2.2 An inspection programme shall be established to ensure that the procedures specified by the standard are followed.
- 5.2.3 The final disposal of hazardous waste remains the responsibility of the waste generator.

[Note: The in-house control of waste produced by health care facilities should be managed in accordance with the provisions of the standard, under the supervision of the facility's infection control committee or a designated department].

5.3 CLOSURE AND BAGGING OF WASTE-HOLDING PLASTIC BAGS

- 5.3.1 Bags containing waste, no matter how they are closed, shall be such that their contents are prevented from escaping.
- 5.3.2 A single bag is normally adequate if it is impervious and sturdy (i.e. not easily penetrated) and if the article can be placed in the bag without contaminating the outside of the bag. Otherwise, double bagging should be used.

5.4 INTERMEDIATE AND FINAL STORAGE AREAS

- 5.4.1 All waste-storage areas shall meet the requirements of the National Building Regulations.
- 5.4.2 Intermediate and final storage areas shall:
 - 5.4.2.1 Be totally enclosed;
 - 5.4.2.2 Be separate from supply rooms or food preparation areas;
 - 5.4.2.3 Have provision for being locked; and
 - 5.4.2.4 Have access restricted to authorised personnel only.
- 5.4.3 Health care facilities that refrigerate stored waste shall use:
 - 5.4.3.1 A lockable, closed cold storage facility; or
 - 5.4.3.2 A lockable, domestic-type freezer unit that is dedicated to the accumulation of waste for disposal. This waste shall be stored at a temperature of 4°C or lower, with freezing being the preferred method of storage.
- 5.4.4 Health care facilities shall prepare a contingency plan for dealing with the storage of refrigerated waste in the event of excess waste being produced, incineration facilities or refrigeration/freezing facilities becoming inoperative.
- 5.4.5 Health care facilities shall prepare a contingency plan to deal with the disposal of waste in the event of a disruption of disposal services.
- 5.4.6 Users of the standard shall refer to the National Building Regulations for information regarding the ventilation of waste-storage areas.

5.5 MOVEMENT OF WASTE

- 5.5.1 Manual handling of waste materials shall be minimised.
- 5.5.2 Carts used for carrying waste shall be:
 - 5.5.2.1 Capable of containing the waste;
 - 5.5.2.2 Designed to prevent spills; and

- 5.5.2.3 Constructed of materials that permit effective cleaning and disinfection.

[Note: Open carts may be used to transfer waste contained within waste containers].

- 5.5.3 Waste containers shall be moved only when properly closed.
- 5.5.4 Specific routes for the movement of waste shall be planned in order to minimise its passage through patient care and other clean areas.
- 5.5.5 Waste disposal chutes should be avoided, but if they are provided, shall be used for general waste purposes only. Such disposal chutes shall comply with all applicable building and fire codes and regulations.
- 5.5.6 The compacting of waste destined for landfill sites shall be determined by the individual health care facility in accordance with national, provincial, regional and municipal legislation and regulations.

5.6 DISPOSAL OF WASTE

The health care facility shall dispose of all waste in accordance with national, provincial, regional and municipal regulations and legislation.

5.7 MAINTENANCE AND CLEANING OPERATIONS

5.7.1.1 Protective apparel

The following protective apparel shall be worn, as necessary, by any personnel engaged in the cleaning of reusable waste containers, waste-movement carts, or final storage areas:

- 5.7.1.1 Water-resistant coveralls.

5.7.1.2 Rubber boots.

- 5.7.1.3 Heavy-duty waterproof gloves.

- 5.7.1.4 Protective goggles or face shields.

[Note: When not in use, protective apparel shall be stored in an area designated for this purpose].

5.7.1.3 Reusable waste containers and waste-movement carts

- 5.7.2.1 Reusable waste containers and waste-movement carts shall be thoroughly cleaned in accordance with the facility's established procedures.
- 5.7.2.2 The frequency of cleaning operations shall be in accordance with the facility's established procedures.
- 5.7.2.3 Reusable waste containers and waste-movement carts shall be thoroughly cleaned before any maintenance work is performed on them.

5.7.2 Storage sites

Floors, walls and ceilings of intermediate and final storage areas shall be thoroughly cleaned in accordance with the facility's established procedures.

5.8	SPILL OR ACCIDENT CLEANUPS
------------	-----------------------------------

- | | |
|-------|--|
| 5.8.1 | Every possible effort should be made to avoid the escape of any hazardous material in the course of normal operations. Minor spills involving loss or release into the air of small volumes of material are most likely to result from faulty transfer techniques. Major spills or accidents usually involve container rupture, caused by equipment malfunction or careless handling. |
| 5.8.2 | As in the handling of all hazardous substances, the most important elements in dealing with a major spill are common sense and a contingency plan prepared and learned in advance. |
| 5.8.3 | Health care facilities shall have a documented policy and procedure for managing spills of a hazardous substance. |
| 5.8.4 | The procedure for managing a spill shall include the following: <ul style="list-style-type: none"> 5.8.4.1 All staff shall be trained and educated in - <ul style="list-style-type: none"> a. The management of hazardous substances; and b.. The recognition and management of a spill condition. 5.8.4.2 A method for the containment and isolation of each type of spill shall be prepared. 5.8.4.3 Should a spill occur, the person or persons designated for spill cleanup shall be notified immediately. These persons shall have specific training in the management of spills. 5.8.4.4 Information concerning individual substances and their cleanup shall be readily accessible to all staff and available on a 24 hour basis. 5.8.4.5 Proper equipment shall be made available for: <ul style="list-style-type: none"> a. Spill cleanups; and b. The protection of employees. 5.8.4.6 The procedures for each type of spill shall be documented and made available in the area where the spill is likely to occur. 5.8.4.7 Procedures for the proper disposal of waste spills according to the waste-management policy of the facility shall be prepared. 5.8.4.8 All incidents shall be documented for the purpose of record keeping. 5.8.4.9 Any employee exposed to a spill shall be treated and monitored by the facility. |

5.8.4.10 If necessary, evacuation and internal disaster plans shall be implemented.

6	SPECIFIC PROVISIONS FOR DEALING WITH THE DIFFERENT TYPES OF HEALTH CARE WASTE
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- 6.1 After dealing with the above general provisions, the standard goes on to deal separately with each of the various categories of health care and general waste.
- 6.2 Readers who require more detailed information on dealing with the relevant categories of waste, are advised to contact the South African Bureau of Standards (SABS) for such information as the standard for dealing with health care waste is constantly under review and being updated as required.
- 6.3 At the invitation of the SABS, a member of the HPCSA's Committee for Human Rights, Ethics and Professional Practice has been nominated to serve on the relevant Committee of the SABS. The HPCSA appreciates this invitation and trusts that it will result in close cooperation between the SABS and the HPCSA in dealing with this important aspect of health care management and protection of the public.

6.4 The following categories of health care waste are addressed in the standard:

6.4.1 Human/animal anatomical waste

The standard deals with its definition and the following subcategories:

6.4.1.1 Human anatomical waste

The item deals with the containment, collection, final storage areas and disposal of human anatomical waste.

6.4.1.2 Animal anatomical waste

The item deals with the containment, collection, final storage areas and disposal of animal anatomical waste.

6.4.2 Infectious non-anatomical waste

The standard deals with the definition, containment, collection, final storage areas and disposal of infectious non-anatomical waste.

6.4.3 Sharps and similar waste

The standard deals with the definition of sharps and similar waste which includes:

6.4.3.1 Needles;

6.4.3.2 Syringes;

6.4.3.3 Blades;

6.4.3.4 Clinical glass; and

6.4.3.5 Any other clinical items capable of causing a cut or puncture; and

their containment, collection and disposal.

6.4.4 Chemical/pharmaceutical waste

The standard on chemical waste deals mainly with hazardous and pharmaceutical chemicals, their definition, basic safety guidelines, basic waste disposal guidelines, the handling and disposal of pharmaceuticals other than cytotoxics, and the handling and disposal of cytotoxic pharmaceuticals.

6.4.5 Radioactive waste

The handling and disposal of radioactive wastes are subject to the Nuclear Energy Act, 1982 (Act No. 92 of 1982).

6.4.6 Pressurised container waste

The standard again deals with the definition, containment, collection and disposal of pressurised container waste.

6.4.7 General waste

The standard deals with the definition, containment, collection and disposal of general waste and briefly addresses the issues of kitchen waste and non-clinical glass waste.

TABLE 1 - SUMMARY OF COLOUR-CODING/LABELING REQUIREMENTS

1	2	3	4
Waste category	Waste subcategory	Colour-coding/labeling	Clause
1. Human/animal*) anatomical waste	1(a) Human anatomical	RED	6.2
	1(b) Infectious animal anatomical	ORANGE**, OR RED	6.3
	1(c) Non-infectious animal anatomical	BLUE	6.3
2. Infectious*) non-anatomical waste		YELLOW	7
3. Sharps and similar waste		"SHARPS" or recognised symbol	8
4. Chemical/ pharmaceutical waste	Chemical waste		9.1/9.2
	Pharmaceutical waste excluding cytotoxic pharmaceutical waste	BLACK, DARK GREEN, or recognised coding	9.3/9.3.4
	Cytotoxic pharmaceutical waste	Cytotoxic hazard symbol	9.3.5
5. Radioactive waste		Radiation hazard symbol	10
6. Pressurised container waste		BLACK or DARK GREEN	11
7. General waste	7(a) Office waste	BLACK or DARK GREEN	12
	7(b) Kitchen waste	BLACK or DARK GREEN	12.4
	7(c) Non-clinical glass waste	BLACK or DARK GREEN	12.5
	7(d) Non-infectious non-anatomical waste	BLACK or DARK GREEN	12
<p>*) Chemical or radioactive solutions containing human/animal anatomical and infectious non-anatomical wastes should be considered as chemical or radioactive wastes respectively.</p> <p>**) ORANGE - 06E53 in BS 5252 (MUNSELL Ref 5YR7/15).</p>			

Ethical guidelines for good practice in the health care professions

The following Booklets are separately available:

- Booklet 1: General ethical guidelines for health care professions***
- Booklet 2: Ethical and professional rules of the health professions council of South Africa as promulgated in government gazette R717/2006***
- Booklet 3: National Patients' Rights Charter***
- Booklet 4: Seeking patients' informed consent: The ethical considerations***
- Booklet 5: Confidentiality: Protecting and providing information***
- Booklet 6: Guidelines for the management of patients with HIV infection or AIDS***
- Booklet 7: Guidelines withholding and withdrawing treatment***
- Booklet 8: Guidelines on Reproductive Health management***
- Booklet 9: Guidelines on Patient Records***
- Booklet 10: Guidelines for the practice of Telemedicine***
- Booklet 11: Guidelines on over servicing, perverse incentives and related matters***
- Booklet 12: Guidelines for the management of health care waste***
- Booklet 13: General ethical guidelines for health researchers***
- Booklet 14: Ethical Guidelines for Biotechnology Research in South Africa***
- Booklet 15: Research, development and the use of the chemical, biological and nuclear weapons***
- Booklet 16: Professional self-development***

ISBN 978-0-626-21200-1

SANS 10248-1:2008

Edition 1

SOUTH AFRICAN NATIONAL STANDARD

Management of healthcare waste

Part 1: Management of healthcare risk waste from a healthcare facility

Published by Standards South Africa
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www.stansa.co.za
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standards
SouthAfrica
(a division of SABS)

SANS 10248-1:2008

Edition 1

Table of changes

Change No.	Date	Scope

Foreword

This South African standard was approved by National Committee StanSA SC 5140.06M, *National committee for dangerous goods standards – Disposal of healthcare waste*, in accordance with procedures of Standards South Africa, in compliance with annex 3 of the WTO/TBT agreement.

This document was published in May 2008. This document supersedes SANS 10248 (edition 2).

SANS 10248 consists of the following parts, under the general title *Management of healthcare waste*:

Part 1: Management of healthcare risk waste from a healthcare facility.

Part 2: (in course of preparation).

Part 3: (in course of preparation).

Annexes A, B, D and F form an integral part of this document. Annexes C and E are for information only.

Introduction

This part of SANS 10248 presents the basic elements for the management of healthcare risk waste. In this respect certain issues are considered to be of importance for the successful application of this standard, namely

- a) the need to deal with the management aspects of healthcare risk waste in addition to the technical operation of healthcare risk waste disposal,
- b) the need for a document suitable for audit purposes that can be administered to fulfil the needs of the generators which might have greatly varying resources,
- c) the need to control the potential hazards from chemicals, materials that emit ionising radiation and the spread of infectious diseases that can place the public and especially waste disposal workers at risk,
- d) the need for guidelines covering the entire cycle, including waste minimization, point of use disposal through internal and external transportation to final treatment and disposal, and
- e) the need for an environmental management policy.

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Management of healthcare waste

Part 1:

Management of healthcare risk waste from a healthcare facility

1 Scope

This standard lays down minimum provisions for the safe and effective management of healthcare risk waste generated by healthcare facilities and other places where healthcare professionals work in order to reduce potential risks to humans and to the environment. The management of healthcare risk waste covers the generation, the packaging, the treatment and the disposal (cradle-to-grave) of the waste.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. Information on currently valid national and international standards can be obtained from Standards South Africa.

2.1 Standards

SANS 452, *Reusable and non-reusable sharps containers* (in course of preparation).

SANS 1518, *Transport of dangerous goods – Design, construction, testing, approval and maintenance for road vehicles and portable tanks*.

SANS 10228, *The identification and classification of dangerous goods for transport*.

SANS 10229-1, *Transport of dangerous goods – Packaging and large packaging for road and rail transport – Part 1: Packaging*.

SANS 10231, *Transport of dangerous goods – Operational requirements for road vehicles*.

SANS 10232-1, *Transport of dangerous goods – Emergency information systems – Part 1: Emergency information system for road transport*.

SANS 10232-3, *Transport of dangerous goods – Emergency information systems – Part 3: Emergency response guides*.

SANS 10233 (SABS 0233), *Transportation of dangerous goods – Intermediate bulk containers*.

2.2 Other publications

Natural Colour Institute (NCS), Scandinavian Colour Institute.

Pantone color formula guide 1000. Moonachie, NJ: Pantone Inc. 1991.

3 Definitions and abbreviations

For the purposes of this document, the following definitions and abbreviations apply.

3.1 Definitions

3.1.1

alternative technology

approved method, technique or process for microbial inactivation or for otherwise altering the biological, chemical or physical characteristics of healthcare risk waste to sterilize such healthcare risk waste by means of technology which do not constitute controlled combustion treatment

3.1.2

approved

acceptable to the relevant approving authority

3.1.3

authorized

approved by the relevant governmental department in accordance with the relevant national legislations and regulations

3.1.4

calorific value

heating value

quantity of heat that is produced when a unit mass of a material undergoes complete combustion under certain specified conditions and expressed in terms of calories or joules per kilogram (MJ/kg for solids and liquids and MJ/m³ for gases)

3.1.5

capacity

optimal quantity of waste that can be processed in a given time under specified conditions, usually expressed in terms of mass per 24 h

3.1.6

chief executive officer

CEO

person responsible for the overall management and control of a healthcare facility

3.1.7

clinical glass

glass that might be contaminated with blood, body fluids or chemicals, e.g, blood collection tubes, laboratory glassware and medication vials

3.1.8

collection

accumulation of wastes from intermediate storage sites for movement to a primary waste holding area or from several primary waste holding areas to the treatment or final disposal site (or both)

3.1.9

colour coding

use of colour on a container or bag or the label attached to such, that serves to identify the category of waste that it contains

3.1.10

container

disposable or reusable vessel in which waste is placed for handling, transportation, storage, or eventual treatment or disposal (or both)

3.1.11

cytotoxic

agent that has a toxic effect on cells, causing cell death or disruption

3.1.12

decontamination

process or mode of action to reduce contamination to a safe level

3.1.13

disinfectant

chemical agent that is able to reduce the number of viable micro-organisms

3.1.14

disinfection

process or mode of action whereby the number of viable micro-organisms are reduced to safe or relatively safe levels

NOTE 1 High-level disinfection is when all micro-organisms, with the exception of small numbers of bacterial spores, are killed.

NOTE 2 Intermediate level disinfection is when *Mycobacterium tuberculosis*, most viruses and fungi are killed, but not necessarily bacterial spores.

NOTE 3 Low-level disinfection is when most bacteria, some viruses and some fungi are killed, but the complete absence of resistant micro-organisms such as tubercle bacilli or bacterial spores cannot be relied on.

3.1.15

disposal

approved deposit, discharge, dumping, placing, or release of any waste material into or on air, land or water in an approved, specified facility, e.g. near surface or geological repository, or the approved direct discharge of effluents into the environment without the intention of retrieval

3.1.16

genotoxic

substance that is capable of interacting directly with genetic material, causing DNA damage that can be assayed for analysis and DNA damage that can be passed on to off-spring

3.1.17

'green' procurement

selection of products and services that minimizes the impact of the products and services on the environment

3.1.18

ground water

water that occupies pores in the soil and cavities and spaces found in the rocks which are situated in the saturated zone of the profile by rising from a deep magmatic source or by the infiltration of rainfall

**3.1.19
handling**

functions associated with the movement of healthcare waste, including storage, treatment and ultimate disposal, by the use of manual systems and automated systems

**3.1.20
hazard**

intrinsic potential property or ability of any agent, equipment, material, or process to cause harm

NOTE Harm is an injury or damage to the health of humans or to the environment (or both).

**3.1.21
healthcare facility**

place or site where professional health services are dispensed to human or animal patients or where biological research is carried out, e.g. laboratories, and includes, *inter alia*, hospitals, clinics, laboratories, rehabilitation centres, sick bays, old age homes, free-standing operating theatres, day units, mobile and stationary clinics, and field stations where biomedical samples are taken

**3.1.22
incineration**

controlled burning of solid, liquid, or gaseous combustible wastes to produce gases and residues that contain little or no combustible material

**3.1.23
micro-organism**

any microbiological entity, cellular or non-cellular, capable of replication or of transferring genetic material

**3.1.24
monitoring**

continuous or non-continuous measurement of a concentration or other parameters for purposes of assessment or control of environmental quality or exposure and the interpretation of such measurements

**3.1.25
radiotherapy**

use of ionizing radiation to treat disease

**3.1.26
recycling**

extraction and recovery of material from scrap or other discarded material that can be reprocessed to manufacture a new product

**3.1.27
residue**

material, such as ash or slag, that remains after combustion or treatment of wastes, or materials extracted from a liquid or gas stream

**3.1.28
risk**

probability that a hazard will cause harm, and the severity of that harm

**3.1.29
segregation**

systematic separation of healthcare waste into designated categories

3.1.30

sewage

community's liquid waste, that is carried off in sewers and comprises a combination of the liquid or water-carried wastes from domestic, municipal, and industrial premises

3.1.31

sewer

system for the collection and transportation of sewage, including conduits, pipes, and pumping stations

3.1.32

sharps

items such as needles, syringes, blades or clinical glass, that are capable of causing cuts, abrasions or puncture wounds

3.1.33

sterilization

reduction of more than 99,9999 % or 6 log₁₀ of the micro-organisms present by means of physical, chemical, or mechanical methods, or by irradiation

3.1.34

storage

placement of waste in a suitable location or facility where isolation, environmental and health protection, and human control (e.g. monitoring for radioactivity and limitation of access) are provided with the intention that the waste will be subsequently retrieved for treatment or disposal (or both) (or clearance of radioactive waste)

3.1.35

treatment

any method, technique or process for altering the biological, chemical, or physical characteristics of the waste in order to reduce the hazards it presents and to facilitate its disposal by volume reduction, disinfection, neutralization, or other change of form

3.1.36

waste

undesirable or superfluous by-product, emission, residue or remainder of any process or activity, any matter, gaseous, liquid or solid or any combination thereof, which

- a) is discarded by any person;
- b) is accumulated and stored by any person with the purpose of eventually discarding it with or without prior treatment connected with the discarding thereof; or
- c) is stored by any person with the purpose of recycling, reusing or extracting a usable product from such matter

3.1.36.1

anatomical waste

pathological waste

waste that contains tissues, organs, body parts, blood and body fluids from patients, fetuses and animal carcasses, but excludes teeth and hair

NOTE 1 Anatomical waste is considered as a subcategory of infectious waste even though it can also include healthy body parts.

NOTE 2 Blood and body fluids from healthy individuals do not fall under this category.

NOTE 3 Animal carcasses generated by the public are not covered by this definition.

3.1.36.2

chemical waste

solid, liquid and gaseous products that are to be discarded and that contain dangerous or polluting chemicals that pose a threat to humans, animals or the environment, when improperly disposed of

3.1.36.3

cytotoxic waste

waste that is toxic to cells and that can lead to cell death

3.1.36.4

genotoxic waste

waste capable of interacting with living cells and causing genetic damage

3.1.36.5

hazardous waste

waste that can, by circumstances of use, quantity, concentration or inherent physical, chemical or toxicological characteristics, have a significant adverse affect on public health and the environment when improperly treated, stored, transported or disposed of

3.1.36.6

healthcare general waste

the portion of waste that poses a minimum degree of risk to human health and the environment, i.e. from administrative and housekeeping activities, e.g. paper, pens, flowers, food packaging, plastics cooldrink bottles, old mops, builders' rubble and garden waste

3.1.36.7

healthcare risk waste

human and animal anatomical waste, infectious human and animal waste, sharps, chemical waste, pharmaceutical waste and radioactive waste generated by healthcare professionals, healthcare facilities and other non-healthcare professionals, e.g. tattooists and taxidermists

NOTE Healthcare risk waste is a subcategory of hazardous waste.

3.1.36.8

infectious non-anatomical waste

waste that contains or is suspected to contain pathogens, bacteria, viruses, parasites or fungi in sufficient concentrations or quantities to cause disease in susceptible hosts

3.1.36.9

pharmaceutical waste

unused medicines, medications and residues of medicines that are no longer usable as medication

3.1.36.10

radioactive waste

liquid, solid or gaseous materials that contain, or are contaminated with, radionuclides at concentrations or activities greater than the clearance levels and for which no use is foreseen

3.1.37

waste generator

any person, organization or facility engaged in activities that generate waste

3.1.38

waste management

all activities, administrative and operational, involved in the handling, treatment, conditioning, storage, and disposal of waste (including transportation)

3.1.39**waste package**

product which includes the waste form, waste container(s), and any internal barriers (e.g. absorbing materials or liners), prepared in accordance with the requirements for handling, transportation, storage, and disposal

3.2 Abbreviations

3.2.1 DEHP Di(2-ethylhexyl)phthalate

3.2.2 EVA ethyl vinyl acetate

3.2.3 HR Hazard Rating

3.2.4 IV intravenous

3.2.5 NCS Natural Colour System ®

3.2.6 PVC poly(vinyl chloride)

3.2.7 Sv sievert (1 Sv = 1 J/kg)

4 Requirements**4.1 Management requirements**

4.1.1 The chief executive officer (see 3.1.6) shall retain overall responsibility for the management of healthcare risk waste in accordance with the relevant requirements and regulations of the current relevant national legislation (see annex A), or any other regulatory requirements of the relevant provincial and local governments.

4.1.2 The CEO of a healthcare facility

- a) may assign responsibilities for the management of healthcare risk waste,
- b) shall adopt a documented waste management policy,
- c) shall approve the implementation plan developed by the waste management team (see 4.2),
- d) shall monitor and review the implementation of the waste management plan,
- e) shall provide sufficient resources for onsite storage facilities, if necessary, and the operation of the facilities in accordance with the current relevant national legislation (see annex A),
- f) shall be responsible for the compliance of on-site treatment facilities with the current relevant national legislation (see annex A), and
- g) shall provide an environmental management policy, where applicable, in accordance with the current relevant national legislation (see annex A).

4.2 Requirements for the waste management team

4.2.1 General

4.2.1.1 The waste management team shall be assigned in accordance with 4.1.2(a) and, depending on the type of healthcare facility, may comprise of the following key members,

- a) a waste management officer;
- b) heads of departments;
- c) an infection control officer;
- d) a chief pharmacist;
- e) a radiation officer;
- f) a senior nursing manager;
- g) a health and safety manager;

NOTE A nominated health and safety representative can be represented on the waste management team. If a health and safety manager has been appointed to oversee two or more health and safety representatives at a healthcare facility, then the health and safety manager can be part of the waste management team.

- h) a maintenance engineer (where possible) or a maintenance manager;
- i) a financial manager;
- j) a procurement manager; and
- k) a waste management contractor when applicable and when required as an advisor in meetings.

NOTE 1 This is not a complete list of the waste management team. The waste management team can also include the cleaning contractor, regional managers or union representatives.

NOTE 2 An environmental health practitioner can monitor incidences that can result in injuries.

4.2.1.2 Members of the waste management team can also hold other positions at the healthcare facility and perform their waste management team responsibilities on an add-on basis.

4.2.1.3 The waste management team shall include the functions of all departments when developing the waste management plan as illustrated in the flow diagram in figure 1.

4.2.1.4 The person responsible for an area or department shall ensure that the healthcare risk waste is managed in that area.

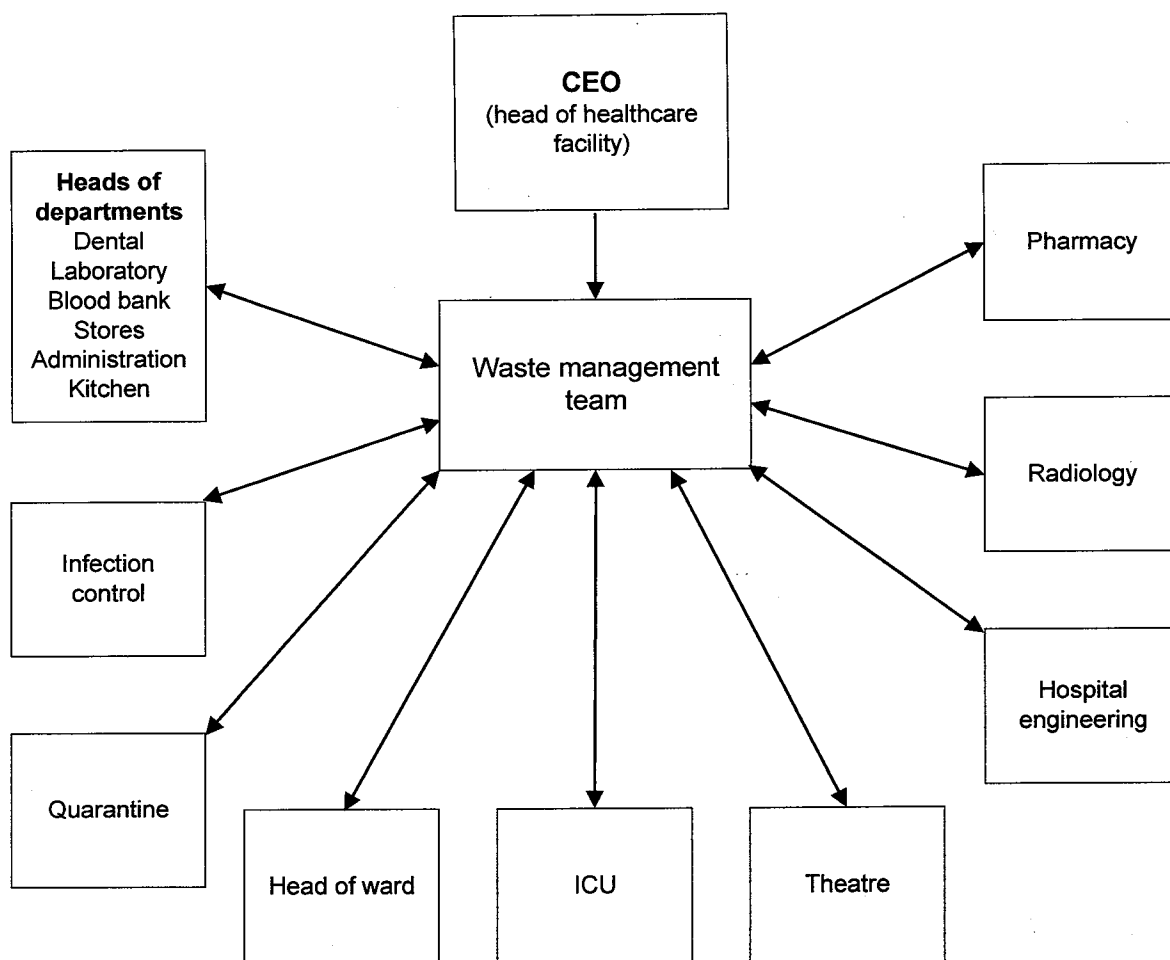


Figure 1 — Example of functions in a healthcare facility

4.2.2 Waste management officer

The waste management officer shall:

- be responsible for the development of a written waste management plan that defines the duties of all staff members in respect of handling healthcare risk waste;
- be responsible for the day to day operation, monitoring and implementation of the waste management plan;
- be responsible for the control of internal collection and transportation of waste;
- monitor and coordinate the staff assigned to containerize, collect, transport and store the healthcare risk waste within the healthcare facility;
- ensure that healthcare general waste (see 3.1.36.6) destined for recycling is stored in a separate area or storeroom;
- ensure that the waste storage points are managed acceptably to prevent unauthorized dumping;
- liaise with the other members of the waste management team to minimize any healthcare risk

waste disposal anomalies and ensure compliance with the waste management plan;

- h) monitor the treatment and disposal of the healthcare risk waste on-site, where applicable;
- i) monitor the collection of the healthcare risk waste by the waste management contractor in accordance with the waste management contract (see annex B) and the waste management plan; and
- j) maintain records of all data produced from consignment notes and any other sources.

4.2.3 Heads of departments

The heads of departments shall manage the generation of healthcare risk waste in their departments, including waste avoidance, segregation, containerization, storage and treatment or disposal (or both). They shall also ensure that:

- a) the doctors, nurses, clinical and non-clinical professional personnel
 - 1) are trained in the segregation and storage procedures of waste, and
 - 2) comply with the waste management plan;
- b) key personnel are trained in the segregation, containerization, storage and internal transportation of healthcare risk waste;
- c) workers are adequately supervised with regard to all operations, including the safe handling of healthcare risk waste; and
- d) any non-compliance of procedures are noted and resolved with the assistance of the waste management officer.

4.2.4 Infection control officer

The infection control officer shall advise the waste management team on

- a) infection control,
- b) the handling of infectious waste,
- c) the health and safety policy, and
- d) the treatment and disposal of healthcare risk waste.

4.2.5 Chief pharmacist

The chief pharmacist shall:

- a) ensure the minimization of pharmaceutical waste;
- b) advise the waste management team on pharmaceutical waste treatment or disposal (or both);
- c) monitor and coordinate the pharmaceutical waste generation, treatment or disposal; and
- d) train staff that are involved in pharmaceutical waste disposal.

4.2.6 Radiation officer

The radiation officer shall:

- a) be appointed by the CEO in accordance with the relevant requirements and regulations of the current relevant national legislation (see annex A);
- b) be responsible for the minimization of radioactive waste by storing short half-life radioactive waste until decayed to a surface dose rate not exceeding 5 $\mu\text{Sv/h}$;
- c) advise the waste management team on the segregation and disposal of radioactive waste;
- d) coordinate the monitoring of radioactive waste production and treatment or disposal; and
- e) be responsible for the training of staff involved in radioactive waste treatment or disposal (or both).

4.2.7 Senior nursing manager

The senior nursing manager shall ensure that nursing staff, assistants, attendants and ancillary staff are trained in the correct procedures for segregation, containerization, storage and internal transportation of healthcare risk waste.

4.2.8 Health and safety manager

The health and safety manager shall:

- a) report any injuries to employees during activities related to the management of healthcare risk waste (see 5.8.3);
- b) investigate and record any complaints regarding health and safety in accordance with the requirements and regulations of the current relevant national legislation (see annex A);
- c) review the effectiveness of the health and safety measures;
- d) liaise with the waste management team to identify potential hazards; and
- e) maintain records of all incidents that contravene operating procedures.

4.2.9 Maintenance engineer or maintenance manager

The maintenance engineer or maintenance manager shall be responsible for

- a) the instalment and maintenance of waste storage facilities, equipment used in the handling of the waste, and on-site waste treatment or disposal facilities,
- b) the training of staff in the operation and maintenance of such facilities and equipment, and
- c) keeping records of the maintenance of the facilities and equipment, and for training of the relevant staff members.

4.2.10 Financial manager

The financial manager shall ensure that there is a budget for the management of healthcare risk waste.

5 The waste management plan

5.1 General

5.1.1 The waste management team shall make an assessment of all the healthcare risk waste generated in the healthcare facility before the development of a waste management plan. The assessment shall include estimates of any future changes in the growth, or designation, of the

healthcare facility or its departments. Data from the survey shall form the basis on which the waste management plan shall be developed.

NOTE It is recommended that the waste management team consider the options and procedures given in the *Self-assessment manual for proper management of medical wastes* (see bibliography) when starting on the development of a waste management plan.

5.1.2 The waste management team shall establish and maintain a documented waste management plan in accordance with the relevant requirements and regulations of the current relevant national legislation (see annex A). The waste management plan shall include documents for all the processes in the healthcare facility (see 5.2.1).

5.1.3 An implementation plan shall form part of the waste management plan.

5.1.4 The waste management team shall ensure that there are written contingency procedures in the event of failure of any aspect of the waste management plan and that trained personnel are aware of the action to be taken.

5.1.5 The waste management team shall be responsible for the constant review and update of the waste management plan to assess opportunities for improvements and to ensure compliance with regulations.

5.2 Documentation requirements

5.2.1 Documents

The documents to be used in the healthcare facility shall include:

- a) work instructions and work procedures that are documented, implemented and maintained;
- b) work instructions and work procedures for training that are developed in a comprehensible format;
- c) quality control procedures;
- d) a document for *pro forma* service level agreements between the different departments;
- e) applicable documents that are available at the point of use;
- f) operating manuals for all equipment;
- g) safety instructions and precautions for the handling and storage of all healthcare risk waste;
- h) an emergency response policy and strategy to deal with spills of infectious and chemical wastes (see 10.1);
- i) non-compliant procedures and the appropriate corrective actions to be taken;
- j) a document on the conduct and behaviour of staff and non-staff members (see 5.6.3);
- k) a document that describes the retention of documents as proof of the proper treatment, destruction and disposal of the healthcare risk waste by the waste management contractor; and
- l) a document that describes record keeping for waste management.

5.2.2 Document control

The waste management team shall establish a procedure for the control of **all** documents related to the approved waste management plan. The controls shall include the following:

- a) that all documents are first reviewed and approved for adequacy before being issued;
- b) the establishment of a suitable identification system for all documents;
- c) the review, update (when necessary) and re-approval of documents every three years;
- d) the establishment of a master list of all controlled documents that indicates the location of the documents and their revision status;
- e) that obsolete documents be withdrawn and replaced with current versions;
- f) that records be controlled in accordance with the policy of the healthcare facility; and
- g) the retention of all documentation and certificates in terms of the relevant requirements and regulations of the current relevant national legislation (see annex A) and the relevant regulatory requirements related to labour issues.

NOTE See annex C for examples of documents.

5.3 Contractual commitments

5.3.1 Contracts for the treatment and disposal of the healthcare risk waste (see annex B) shall be entered into **only** when the waste management contractor discloses a license or permit authorized by the relevant authority for the treatment or disposal (or both) of each category of healthcare risk waste in accordance with the relevant requirements and regulations of the current relevant national legislation (see annex A).

5.3.2 The healthcare facility shall be responsible for the healthcare risk waste from generation to its final disposal in accordance with the relevant requirements and regulations of the current relevant national legislation (see annex A), even when a contract has been agreed to with a waste management contractor for the treatment and disposal of this waste.

5.3.3 The healthcare facility shall maintain documented evidence of monitoring the waste management contractor (see 5.2.1(k)), e.g. that destruction documents are completed and correctly signed-off (see also 9.1.2, 9.3.1.8 and 11.6.2).

5.3.4 The requirements to be included in the contractual agreement between the healthcare facility and the waste management contractor are given in annex B.

5.4 Work procedures and work instructions

5.4.1 The work procedures and work instructions for the management of healthcare risk waste shall be:

- a) in a format that is easy to read and that is comprehensible to operators; and
- b) posted at work places and at the point of use.

5.4.2 Work procedures and work instructions shall be established for at least the following:

- a) the identification of the healthcare risk waste category in accordance with 6.1 and table 1;

- b) the segregation of the healthcare risk waste into an appropriate colour-coded container (see 6.3 and table 1);
- c) training in the work procedures and work instructions (see 5.7);
- d) cleaning and disinfection;
- e) the correct use of all facilities, equipment and personal protective equipment;
- f) the storage of the healthcare risk waste at the point of generation until its collection;
- g) the transportation of the containerized healthcare risk waste for storage (see clause 9);
- h) the transportation of the healthcare risk waste for on-site treatment;
- i) the on-site treatment of the healthcare risk waste;
- j) the classification and final disposal of the residue from the treated healthcare risk waste in accordance with the relevant requirements and regulations of the current relevant national legislation (see annex A);
- k) the control and monitoring of processes in each department to achieve the specified cleanliness and infection control;
- l) rules on leaving the work area, and for working hours and break times; and
- m) visual warnings and details on hazardous healthcare material, dangerous areas and technical facilities that can create hazards.

5.5 Inspection and quality control

Each department shall provide documentation that verifies

- a) the categories of healthcare risk waste generated (see table 1),
- b) the number and sizes of containers of each category of healthcare risk waste generated in a specific time period,
- c) the date of collection,
- d) the authorized collector and proposed final point of treatment or disposal (or both),
- e) any deviations from the standard procedure,
- f) any corrective actions taken, and
- g) a record of treatment and disposal by the waste management contractor.

NOTE The recording of treatment and disposal at departmental level can be required by the waste management plan.

5.6 Health and safety policy

5.6.1 The waste management plan shall include the health and safety policy, and shall be issued and communicated to all employees.

5.6.2 The health and safety policy shall include recommendations for a medical examination or check-up, and a policy on immunization for employees in contact with, or handling, healthcare risk waste.

NOTE 1 It is recommended that employees be offered counselling and appropriate immunization for certain

diseases, e.g. hepatitis B and tetanus. Counselling and treatment should also be offered to employees after occupational exposure to HIV and AIDS.

NOTE 2 It is recommended that employees who decline immunization, or who do not seroconvert, be advised in writing about the occupational risk associated with the work environment.

5.6.3 The health and safety policy shall be supplemented and supported by house rules which shall govern the conduct of personnel at the healthcare facility, non-company personnel, and the personnel of the waste management contractors (see annex B).

5.6.4 The health and safety policy shall be aimed at the safety and well-being of all employees, visitors and the public. The policy shall also ensure that all risks are considered and that the appropriate action is taken by the waste management officer to prevent the infection and contamination of the environment with healthcare risk waste.

5.6.5 The health and safety policy shall comply with all the relevant requirements and regulations of the current relevant national legislation that relate to air pollution, water pollution, soil pollution, occupational health and safety, and public health (see annex A).

5.7 Training

5.7.1 Training shall be provided to all employees at the beginning of employment, all contract workers that might be exposed to healthcare risk waste, and when new tasks or equipment are introduced. The training shall cover at least the following:

- a) the nature of the work;
- b) the chain of command, including the name(s) of the person(s) responsible for the work area(s);
- c) the safe handling of hazardous waste;
- d) the contents of the Material Safety Data Sheets (MSDSs);
- e) the meaning of the specific hazard risk warnings (R-phrases) and safety advices (S-phrases) likely to be found on the MSDSs;

NOTE SANS 10265 can be consulted regarding the format of an MSDS and the meanings of the R-phrases and S-phrases.

- f) the use of protective clothing;
- g) disposal procedures; and
- h) information on the health hazards associated with the work.

5.7.2 The training shall be repeated, refreshed or updated at least once a year.

5.7.3 A sufficient number of employees shall receive training to cover for leave periods, absences due to illness, and public holidays.

5.7.4 An attendance register should be kept and signed by each employee at each training session.

5.8 Workplace hygiene

5.8.1 Employees shall not eat, drink or smoke in areas where healthcare risk waste is handled and stored. "No smoking" signs shall be displayed and obeyed at all times.

5.8.2 Separate areas shall be designated or provided for eating, drinking and smoking, in accordance with the relevant requirements and regulations of the current relevant national legislation (see annex A).

5.8.3 All injuries, including minor traumas, shall receive immediate medical attention and shall be reported to the health and safety representative in accordance with the relevant requirements and regulations of the current relevant national legislation (see annex A). Records of all reports shall be kept.

5.8.4 A regular supply of clean overalls, protective clothing, gloves and footwear, or other appropriate safety equipment that is specific for the work activities, shall be provided.

5.8.5 Work clothing shall be washed between uses by a laundry facility equipped to process clothing from healthcare facilities.

5.8.6 Employees that are in contact with or handle all hazardous healthcare risk waste shall also be provided with suitable gloves, aprons and, where necessary, face masks or breathing apparatus.

5.8.7 Employees working with hazardous healthcare risk waste shall not enter clinical areas or recreation or eating facilities without the removal of protective clothing.

5.8.8 When leaving "clean" areas, employees shall wash and don clean overalls or protective clothing upon returning to the "clean" areas.

5.8.9 Employees at managerial level, and visitors, shall wear the appropriate protective clothing when entering areas allocated for the handling of hazardous healthcare risk waste.

5.8.10 Personal protective equipment and facilities shall be kept clean and in good condition.

5.8.11 Hand-wash basins and, where applicable, showers with hot and cold water and soap or shampoo shall be provided.

5.8.12 The lockers provided to store personal clothing and personal items shall be situated away from work areas. The lockers shall not be used to store work clothing and personal protective equipment.

5.8.13 An emergency shower or eye-wash facility shall be provided in the washroom area and where chemicals are stored or handled.

6 Identification, classification, segregation, collection and minimization of healthcare waste

6.1 Identification

6.1.1 The management of healthcare risk waste shall start with the correct identification of the waste, followed by classification, segregation, collection and minimization. The generators of waste shall be responsible for the identification and segregation of the waste.

6.1.2 Healthcare waste is grouped into healthcare risk waste and healthcare general waste and categorized as follows:

- a) **healthcare risk waste categories:** infectious waste, anatomical (pathological) waste, sharps, chemical and pharmaceutical waste, heavy metals, pressurized containers and radioactive waste; and

b) **healthcare general waste categories:** packaging material, kitchen waste (domestic waste), office waste and building demolition waste, waste from patients (e.g. fruit juice bottles and magazines), non-clinical glass, non-infectious non-anatomical waste (e.g. paper tissues), disposable curtains, extracted teeth, nail clippings, hair and decontaminated waste, and garden and park waste.

6.1.3 For traceability and treatment purposes the waste shall be identified in accordance with 6.1.2 and shall be correctly labelled.

6.2 Classification (see annex D)

All healthcare risk waste shall be classified in accordance with SANS 10228, as expanded on in the relevant requirements and regulations of the current relevant national legislation (see annex A). The healthcare risk waste shall also be classified in accordance with the hazard and risk involved.

6.3 Waste segregation

6.3.1 The waste shall be segregated at the point of generation and shall be containerized to minimize the risk of contamination or pollution to the environment and humans.

6.3.2 Employees shall be trained in the correct identification and segregation of the waste (see flow diagram in figure 2).

6.4 Collection

The healthcare risk waste shall be collected at the point of generation (where applicable) and shall be the first step in the removal of the waste to its final disposal point.

6.5 Waste minimization

Careful pre-planning can minimize the amount of healthcare risk waste generated by a healthcare facility. Effective procurement and stock management, recycling where possible, and resource recovery should be considered as part of the management of waste.

NOTE See annex E for information on 'green' procurement.

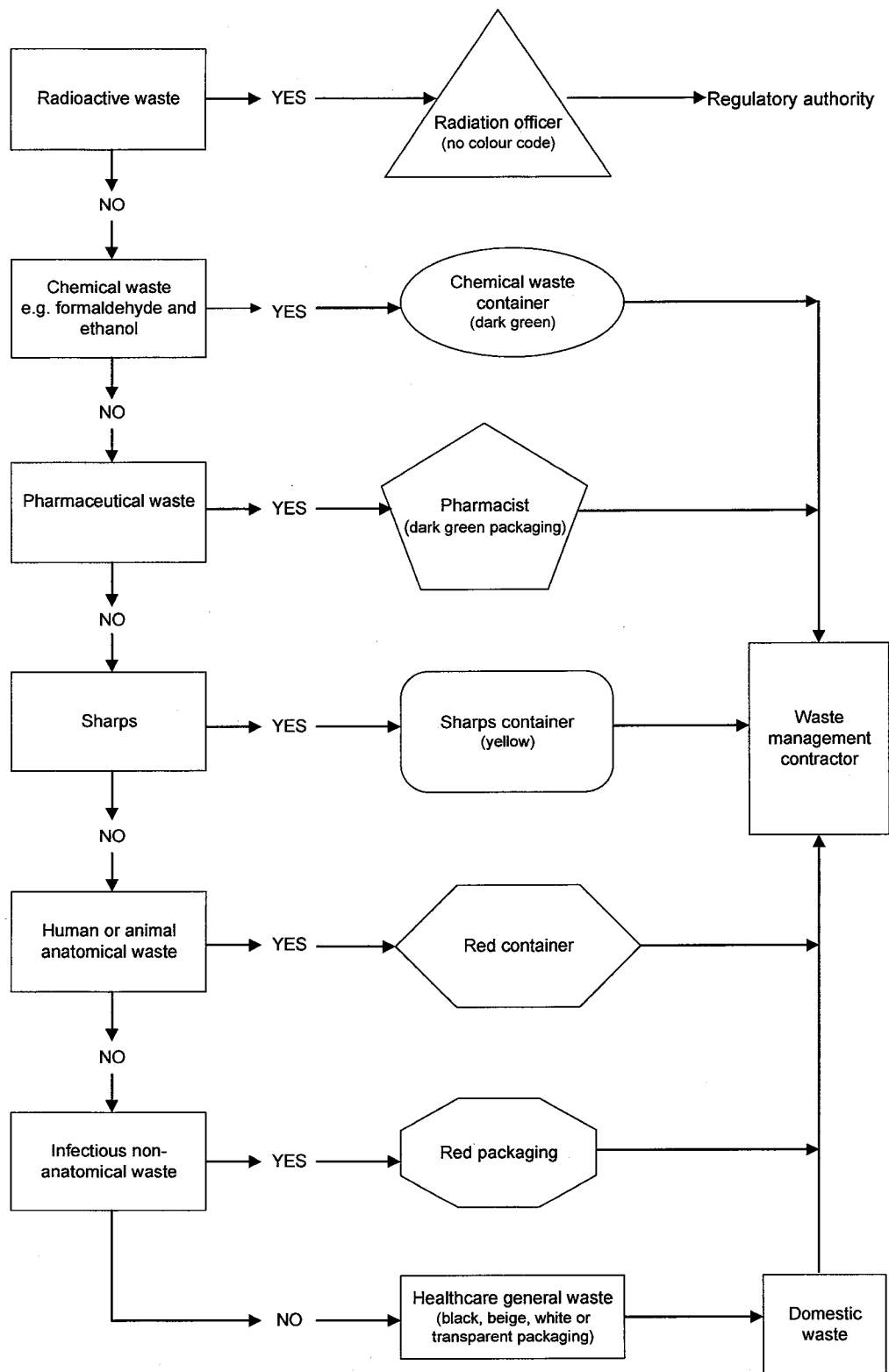


Figure 2 — Healthcare risk waste flow diagram

7 Packaging

7.1 Packaging requirements for healthcare general waste

7.1.1 Solid healthcare general waste shall be placed in a colour-coded waste container in accordance with table 1.

7.1.2 A plastics bag used for the containment of healthcare general waste shall not tear easily during handling and transportation.

7.1.3 The waste containers shall be filled in accordance with the relevant requirements and regulations of the current relevant national legislation (see annex A) and shall be securely closed to prevent spillage of the contents and access by scavengers or vermin.

NOTE Arrangements can be made with a waste removal service for high-density materials such as small amounts of building rubble and garden refuse, e.g. by the provision of on-site collecting bins.

7.2 Packaging requirements for healthcare risk waste

7.2.1 Plastics bags used as stand-alone containers shall have a thickness of 80 µm or more.

7.2.2 Plastics bags used as liners which form an integral part of a rigid container shall have a thickness of 60 µm or more.

7.2.3 When transported, all healthcare risk waste shall be packed and labelled in accordance with SANS 10229-1.

7.2.4 The lettering on the label shall be of a size, style and layout that is clearly legible. The colour of the surface area immediately surrounding the label shall contrast with the background of the label.

7.3 Colour coding of packaging

7.3.1 The packaging for healthcare risk waste shall be clearly marked with the appropriate colour code and the appropriate international hazard label(s) illustrated in annex F.

7.3.2 Table 1 gives the internationally accepted categories, sub-categories, colour coding, and labelling protocol for healthcare waste.

NOTE A colour coding system is used for ease of identification for the different categories.

Table 1 — Healthcare waste categories, colour coding and international hazard label

1	2	3
Waste	Waste sub-category	Colour coding and international hazard label ^a
^b Human or animal anatomical waste	Infectious human anatomical	RED and the appropriate international infectious hazard label
	Infectious animal anatomical	ORANGE and the appropriate international infectious hazard label
	Non-infectious animal anatomical	BLUE
^b Infectious non-anatomical waste	None	RED and the appropriate international infectious hazard label
Sharps	None	YELLOW , the words "DANGER CONTAMINATED SHARPS" and the appropriate international infectious hazard label
Chemical waste including pharmaceutical waste	Chemical or pharmaceutical	DARK GREEN and the appropriate international hazard label
	Cytotoxic pharmaceutical	DARK GREEN and the cytotoxic hazard label (see figure 3)
Radioactive waste	None	No colour coding – only the appropriate international radiation hazard label
General waste		No hazard label ^c
^a See annex F for international hazard labels. ^b Chemical or radioactive solutions that contain human or animal anatomical and infectious non-anatomical wastes are considered as chemical waste or radioactive waste, respectively. ^c Black, beige, white or transparent packaging can be used.		

7.4 Packaging for infectious waste (excluding sharps)

7.4.1 Packaging for infectious waste shall be made from an impermeable, leak-proof material and shall be compatible with the envisaged treatment of the waste.

7.4.2 Packaging for infectious waste shall be filled to three-quarters capacity of the container and shall be securely closed.

7.4.3 Plastics bags shall be closed by means of non-PVC plastics ties, non-PVC plastics sealing tags of the self-locking type, or heat sealers purpose-made for healthcare risk waste. Plastics bags shall **not** be closed by means of stapling.

7.4.4 All category A waste, as indicated in SANS 10228 (e.g. contaminated with viral haemorrhagic fevers), shall be handled in accordance with procedures of the healthcare facility. The waste shall be placed into a double-layered plastics bag colour-coded in accordance with table 1 and shall be sealed (see 7.4.3). The sealed bag shall then be placed into a rigid disposable container colour-coded and labelled in accordance with table 1.

7.5 Packaging for sharps

7.5.1 A sharps container shall be used for the collection of all sharps (see 3.1.32).

7.5.2 All sharps containers shall be:

- a) manufactured in accordance with SANS 452;
- b) rigid, puncture-proof, tamper-proof and clearly marked in accordance with 7.2.3, 7.2.4 and table 1; and
- c) constructed from a material and in a manner that safely retains the sharps and any residual liquids from syringes (e.g. high-density polypropylene).

7.5.3 The lid of a sharps container shall be such that when sealed it cannot be released without excessive force. In the case of reusable sharps containers, the lid shall only be opened by means of an automated process or a process that prevents the risk of needle-stick injuries and contamination to the employees at the waste disposal facility.

7.5.4 The sharps container available in each department shall be appropriate for the type of work (e.g. a large sharps container where trocars are used).

7.5.5 Consideration can be given to the installation of needle destructors (incinerators) particularly when sharps waste disposal facilities are not optimal. This option shall **only** be applicable on the availability of a safe disposal system for the residue after incineration, and provided that the needle incinerator shall be used and maintained efficiently.

7.6 Packaging for chemical waste

7.6.1 General

7.6.1.1 Chemical waste intended for transportation outside a healthcare facility shall be classified in accordance with SANS 10228 and shall be packaged in accordance with SANS 10229-1 or SANS 10233.

7.6.1.2 Chemical waste shall first be sorted into the different hazard classes (see annex D) and then divided into chemical, pharmaceutical or cytotoxic waste, as applicable. Hazardous chemical waste of different classes shall not be mixed.

7.6.1.3 The packaging shall be clearly colour-coded dark green (see table 1) and marked in accordance with 7.2.3 and 7.2.4.

7.6.1.4 Chemical waste may be placed in empty containers that originally contained the same type of chemical, provided that the original label is removed or clearly defaced.

7.6.2 Packaging for waste aerosol dispensers and gas cylinders of class 2

7.6.2.1 Waste aerosol dispensers

Waste aerosol dispensers shall:

- a) be stored in black plastics bags and shall be clearly marked "**Waste aerosol dispensers**" to distinguish from general waste;
- b) be itemised separately in a plastics bag for disposal via landfill or for recovery at a specialized facility; and
- c) not be disposed of by incineration.

7.6.2.2 Gas cylinders

7.6.2.2.1 Empty gas cylinders shall not be disposed of as healthcare general waste or healthcare risk waste or in an alternative treatment facility, and shall not be incinerated.

7.6.2.2.2 Empty gas cylinders shall be returned to the supplier for reuse, where appropriate.

7.6.3 Packaging for waste flammable liquids of class 3

7.6.3.1 Chlorinated and non-chlorinated solvents shall be segregated and stored in separate waste containers.

7.6.3.2 A waste flammable liquid can be stored in a metal or a high-density plastics container, or drum, that can be sealed with a screw cap lid. An alternative that might be acceptable for audit purposes would be to store the waste solvents in empty containers from which they were supplied (see 7.6.1.4).

7.6.3.3 Each container or drum shall:

- a) be marked "CHLORINATED ORGANIC SOLVENT WASTE" or "ORGANIC SOLVENT WASTE";
- b) be colour-coded dark green in accordance with table 1;
- c) bear the appropriate international hazard label for flammable liquids of class 3 (see annex F); and
- d) have, where necessary, a bold warning "**HIGHLY FLAMMABLE**" or "**FLAMMABLE**" depicted.

7.6.4 Packaging for waste oxidizing substances and organic peroxides of class 5

7.6.4.1 Waste oxidizing substances (see division 5.1 in annex D) and organic peroxides (see division 5.2 in annex D) shall be kept apart and shall also be segregated from other wastes.

7.6.4.2 These types of waste (see 7.6.4.1) shall be stored in plastic-lined metal drums, or high-density plastics drums, and shall be fitted with tamper-proof sealable lids.

7.6.4.3 A container with division 5.1 waste shall be clearly marked "OXIDIZING CHEMICAL WASTE" and shall bear the appropriate international hazard label for oxidizers of division 5.1 (see annex F).

7.6.4.4 A container with division 5.2 waste shall be clearly marked "ORGANIC PEROXIDE WASTE" and shall bear the appropriate international hazard label for organic peroxides (see annex F).

7.6.5 Packaging for waste toxic substances of class 6, division 6.1

7.6.5.1 Waste toxic substances shall be segregated and each type of toxic waste shall be stored in a separate container.

7.6.5.2 The containers shall be made of metal or high-density plastic and shall be sealed with a screw cap lid or a tamper-proof lid.

7.6.5.3 Each container shall:

- a) be clearly marked to indicate the toxic chemical waste inside;
- b) be colour-coded dark green in accordance with table 1; and
- c) bear the appropriate international hazard label for toxic substances of division 6.1 (see annex F).

7.6.5.4 Empty containers in which extremely toxic chemicals are supplied shall not be stored for future use as waste storage containers.

7.6.6 Packaging for pharmaceutical waste

WARNING! SPECIAL PRECAUTIONS ARE TO BE TAKEN TO PREVENT THE THEFT AND ILLEGAL DISTRIBUTION OF PHARMACEUTICAL WASTE.

7.6.6.1 The containers for liquid pharmaceutical waste shall:

- a) be made of metal or high-density plastic and shall be sealed with a screw cap lid or a tamper-proof lid;
- b) be clearly marked "PHARMACEUTICAL WASTE – LIQUID";
- c) be colour-coded dark green in accordance with table 1; and
- d) bear the appropriate international hazard label for toxic substances of division 6.1 (see annex F).

7.6.6.2 When the liquid pharmaceutical waste has a subsidiary risk of "flammability", the appropriate international hazard label for flammable liquids of class 3 shall also be affixed to the waste container.

7.6.6.3 Solid pharmaceutical waste shall be stored in double layer plastics bags which shall:

- a) be colour-coded dark green in accordance with table 1;
- b) be clearly marked "PHARMACEUTICAL WASTE – SOLID"; and
- c) bear the appropriate international hazard label for toxic substances of division 6.1 (see annex F).

7.6.6.4 The plastics bags for solid pharmaceutical waste shall be securely sealed by means of non-PVC plastics ties, steel-wire, non-PVC plastics sealing tags of the self-locking type, or heat sealers purpose-made for healthcare risk waste.

7.6.7 Packaging for cytotoxic and genotoxic waste

7.6.7.1 Cytotoxic waste can be generated from several sources that include the following:

- a) contaminated material from drug preparation and administration (e.g. needles, gauges, vials and packaging);