

HEALTHCARE RISK WASTE MANAGEMENT

SEGREGATION

PACKAGING AND STORAGE

GUIDELINES

FOR

HEALTHCARE RISK WASTE

November 2010

4th edition

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DOHC 3rd edition issued in April 2004)**



Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive



**DEPARTMENT
OF HEALTH
AND CHILDREN
AN ROINN
SLÁINTE
AGUS LEANAÍ**

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Preface to HSE updated Fourth Edition

This update to the DOHC Segregation Packaging and Storage Guidelines for Healthcare Risk Waste deals principally with changes necessary to take account of revisions in regulations which have been issued since 2004.

The principal change from the 2004 edition relates to the definition of “infectious” given in the ADR Regulations. More recent editions of ADR divide infectious agents into two categories, rather than four, as used previously. This also somewhat distances the definition from that used by the Priority Waste Streams Project Group quoted in the 2004 Guidelines.

The update has been overseen by the Estates Directorate of the HSE. The original Guidelines were produced by DOHC to assist the introduction of the Joint Waste Management Board (JWMB) all-island contracted service for the collection and disposal of healthcare risk waste from publicly-funded hospitals. As part of the reforms in the health services, the DOHC’s role in the JWMB transferred to HSE and, with it, the management of the healthcare risk waste contract.

The contribution of Stephen McGarry, Inspector, Health and Safety Authority, who reviewed the draft update, is gratefully acknowledged.

SEGREGATION, PACKAGING AND STORAGE GUIDELINES FOR HEALTHCARE RISK WASTE

1. Introduction

This document offers guidance for a uniform system for the segregation and packaging of clinical/healthcare risk waste generated in the provision of patient care in the Republic of Ireland. It aims to bring together good practice principles relating to waste management and the specific requirements of the various regulations affecting waste. It does not purport to be a legal interpretation of such regulations.

The need for segregation and good packaging follows from the application of basic waste management principles in the sector. These, in turn, are dictated by environmental, health and safety considerations and statutory requirements. The guidance is intended as an aid to the proper management and housekeeping of healthcare waste and as a reference for personnel involved in educating and training healthcare staff. Demonstrable adherence to the principles outlined in the guidelines should assist in the provision of quality and risk assurance while also reducing exposure to regulatory or reputational risk.

The majority of clinical/healthcare risk waste generated throughout the island of Ireland is processed using non-incineration disinfection technology. This entails shredding and disinfection of the waste at specialised treatment plants, followed by disposal of the treated waste by the municipal or commercial waste disposal route. The treatment and final disposal facilities are licensed by the Environmental Protection Agency. A small amount of the waste which is unsuitable for treatment in this way is sent abroad for incineration. The waste is collected and transported to the treatment facilities in specially fitted trucks. Wheeled bins are used as the basis of the collection and transportation system for the majority of waste and a tagging and bar coding system is used to help with traceability.

The guideline puts forward a preferred packaging system which has as its aim the efficient and consistent management of waste generated in the hospital environment.

The document was prepared originally in the Hospital Planning Office of the Department of Health and Children following consultation with a committee representative of the Infection Control Nurses Association - Irish Regional Group, and the Irish Society of Clinical Microbiologists. Comments were also provided by a number of individuals with expertise in the field of medical laboratory science as well as from the Health and Safety Authority. The current update has been overseen by the Estates Directorate of the HSE.

1.1 Scope

This guideline covers the vast majority of waste generated in the provision of patient care. It focuses on the management of infectious and other clinical/healthcare risk waste. Expert advice should be sought from specialists in clinical microbiology and/or infection control in the rare event of having to deal with wastes that are contaminated with what are regarded as high risk biological agents.

Practitioners and other personnel, such as medical scientists and laboratory staff, who have to deal with waste contaminated with high risk infectious agents should satisfy themselves concerning best practice and the appropriateness of the packaging and disposal method to be employed, having regard to statutory requirements. Personnel involved in the management of isolation facilities or in diagnostic or research laboratories should have specific regard to the requirements of the Safety, Health and Welfare at Work (Biological Agents) Regulations, 1994 (S.I. No. 146 of 1994) and subsequent amendment, S.I. No. 248 of 1998.

1.2 Background

In the early 1990's, the Department of Health and Children, in consultation with Health Boards and acute Voluntary Hospitals, developed a strategy and policy for dealing with the management and disposal of healthcare waste generated in publicly funded hospitals. The approach adopted aimed to encourage good and safe waste management and disposal practices while at the same time minimising the amount of waste requiring disposal as hazardous waste. Guidance on basic principles underlying good waste management practices were set out in *Health Services Waste Policy* which was issued by the Department in 1994.

Clinical/healthcare risk waste from the public health services throughout the island of Ireland has been treated by means of disinfection technology since early 2000. This has been done as part of a co-operation initiative between the two health services, North and South. Since then, the waste, once treated, is sent to an appropriate licensed facility for recycling or disposal. A small fraction of the waste (around 5%) is unsuited to the treatment technology and is exported for incineration as there are no suitable treatment facilities available in Ireland, currently.

1.3 Layout of the Document

The guideline is laid out in 8 parts in the body of the document together with 5 appendices.

- Part 1 introduces the topic.
- Part 2 deals with definitions and the categorisation of healthcare waste.
- Parts 3, 4 and 5 set out the background and regulatory requirements relating to segregation, packaging and transportation.

These topics are intimately linked. Segregation is considered fundamental to the proper management of the various waste categories. Different packaging may be needed for each category or sub-category. Packaging requirements are dictated by transport requirements and regulations. Consequently, segregation is largely governed by the transport requirements for packaging.

- Part 6 puts forward the preferred packaging system which is at the core of the document.
- Parts 7 and 8 respectively deal with storage/handling and health and safety.

2. Waste Management

2.1 General

Good practices in the generation and housekeeping of waste are the key to responsible and successful healthcare waste management. Principles of minimisation by reduction, reuse, recycling and product substitution are now accepted as being fundamental to any sustainable and economically viable waste management system. These principles are outlined in the Health Services Waste Policy¹.

The basic elements of an up-to-date healthcare waste management system include:

- ◆ A proper understanding of the nature of the waste generated.
- ◆ The ability to identify and segregate hazardous waste.
- ◆ The ability to safely segregate different hazardous waste fractions into separate streams in accordance with the disposal method appropriate to each stream.
- ◆ The use of packaging which keeps any hazard confined so that personnel and the environment are protected during storage, handling and transportation.
- ◆ Understanding and adherence to statutory requirements in relation to packaging, labelling and consignment of hazardous waste.
- ◆ The use of licensed carriers and appropriate vehicles for transportation of the waste for treatment or final disposal.
- ◆ The use of a uniform tagging and tracking system which enables the waste to be identified and traced at all stages from generation to disposal.
- ◆ Appropriate and proper final disposal to suitably licensed facilities.
- ◆ Maintenance of comprehensive records
- ◆ Audit, evaluation and improvement.
- ◆ Accountability/monitoring and performance measurement.

Inherent in such a system is the necessity to train all personnel involved in the management of the waste so that they are sufficiently knowledgeable to safely carry out any functions for which they have responsibility in accordance with best practice and in compliance with statutory requirements.

2.2 The Nature of Healthcare Waste

Healthcare waste is the solid or liquid waste arising from healthcare. Specific definitions associated with healthcare waste are outlined below. A small proportion of healthcare waste is technically hazardous, or, risk waste. The emphasis in the approach adopted in recent years has been to manage hospital waste by segregating healthcare risk waste from the bulk of waste, which is domestic in nature.

¹ Waste Management Policy, Estates Directorate Statement of Guiding Principles (Up-dated DOHC 1994 Policy) - HSE 2010

Most commonly, healthcare risk waste is classified as hazardous or dangerous due to the risk of it being infectious or because it contains used sharp materials that could cause injury.

The infectious risk can be eliminated by either incineration or by disinfection. Disinfection methods (often referred to as “alternative technology”) include heat treatment, radiation or chemical disinfection. In such processes the risk from sharp objects is usually eliminated by pulverisation. With non-incineration methods, the waste, once rendered free of infection, is no longer a “dangerous substance” or “risk waste” for transport or disposal purposes. A small fraction of healthcare risk waste may be unsuited for treatment by the principal method and this must be segregated and separately presented to the contractor for appropriate specialist disposal, usually by incineration. The waste may be unsuitable for treatment because it has hazardous properties which are not treatable by the process, or, because it contains material which, for aesthetic, cultural or religious reasons, makes it inappropriate for such disposal. The key to successful management of such waste is segregation at source. Clear definitions are crucial in the process of segregation.

2.3 Healthcare Waste Definitions

There is no simple direct definition of what constitutes healthcare waste. Broadly similar methods of defining wastes statutorily are provided under two separate sets of legislation; the Waste Management Act, 1996 and the Carriage of Dangerous Goods by Road Act 1998. The former legislation deals with protecting the environment while the latter emanates from health and safety considerations particularly regarding the safe packaging and handling of dangerous goods, which include healthcare risk waste, while in transit.

2.3.1 Waste Management Act 1996 and 2001

Wastes are defined, under the Waste Management Act, by reference to certain broad categories. In line with the European Hazardous Waste Directive harmonizing the categorization and control of waste, hazardous waste is further defined by reference to specific generic types provided the contents display specific hazardous properties. The generic types of relevance to healthcare include:

- anatomical substances, hospital or other clinical waste
- pharmaceutical, medicinal or veterinary compounds
- chemical substances or laboratory residues.

Items on the list of hazardous properties of most relevance to healthcare include:

- flammable (H3)
- toxic (H6)
- carcinogenic (H7)
- corrosive (H8)
- infectious (H9)
- mutagenic (H11)
- ecotoxic (H14)

The infectious property is the foremost hazard in dealing with healthcare waste. Infectious substances are defined as substances containing viable micro-organisms or their toxins, which are known to cause disease. The Act specifically refers to the European Waste Catalogue

(EWC) and Hazardous Waste List² which contains a fuller list and a breakdown of the different general categories of waste and EWC numbers. Chapter 18 of the EWC List consists of “wastes from human or animal health care and/or related research”. It has 16 entries in 3 sub-sections and some of the entries are specifically marked as hazardous. (See Appendix 4).

The Act places the primary responsibility for waste and its proper disposal on the producer or holder of the waste. Disposal means the acceptance of the waste by a local authority or private waste contractor properly licensed/permitted to transport store and treat such healthcare wastes. (Disposal by any other means is contrary to the regulations and in such an event the producer may continue to be regarded as the holder of the waste in law and could be held responsible for the waste). The Producer is also responsible for the safety of staff, contractors and members of the public who may be exposed to the waste.

2.3.2 Transportation Regulations

Carriage of Dangerous Goods by Road Regulations and other similar international rules regarding the transfer of dangerous goods by other modes of transport follow UN modal regulations and EU directives. These have adopted largely similar rules built on a dangerous goods classification system which is based on 9 different classes of dangerous substances, some of which occur in healthcare waste. The rules, as they affect the packaging and transportation of healthcare risk waste, are outlined in **Section 5**.

2.3.3 Practical Definitions and Categorisation

Historically, different definitions have been used in relation to healthcare waste in different sectors and in different parts of Europe. In the early 1990s the EC Council of Environment Ministers established a Priority Waste Stream (PWS) Project Group to examine and develop a strategy for dealing with healthcare waste. Clinical or healthcare risk waste was identified as one of a number of “problem” waste streams requiring deliberation on how best it should be managed. The Project Group formulated definitions for "Healthcare Waste" and "Healthcare Risk Waste". In the absence of a detailed statutory Irish definition, the definitions recommended by the EU Priority Waste Stream Project Group were informally adopted in the DOHC 1994 Health Services Waste Policy. The definitions, albeit, with the addition of a rider qualifying the term “infectious”, is reproduced in **Table 2.1**.

In an effort to render the PWS definition of more practical use, a group representing the Infection Control Nurses Association - Irish Regional Group - and the Irish Society of Clinical Microbiologists, in 1998, prepared and agreed with the Department of Health and Children, a categorisation of the wastes which takes account of the Waste Catalogue and the PWS definition. This is reproduced in **Appendix 1** and is summarised in **Table 2.2** below.

² European Waste Catalogue and Hazardous Waste List, EPA, 2002

Table 2.1 Priority Waste Streams Definition

Priority Waste Stream Project Group Definitions

(a) **Healthcare:** The medical activities such as diagnosis, monitoring, treatment, prevention of disease or alleviation of handicap in humans or animals, including related research (see note 1) performed under the supervision of a medical practitioner or veterinary surgeon (see note 2).

(b) **Healthcare Waste:** The solid or liquid waste arising from healthcare.

(c) **Healthcare Risk Waste:**

- Biological (recognisable anatomical waste)
- Infectious (see note 3)
- Chemical, toxic or pharmaceutical including cytotoxins
- Sharps (e.g.. needles, scalpels, sharp broken materials)
- Radioactive (refer to Radioactive Waste Directive(s))

Note 1: Wherever appropriate and applicable, waste from basic and fundamental biomedical and other research shall be managed in accordance with the principles set out for Healthcare Waste and Healthcare Risk Waste.

Note 2: The above mentioned supervision may also be carried out by any other person authorised by virtue of their professional qualifications to do so.

Note 3:* **Infectious waste** is any Healthcare Waste known or clinically assessed to be at risk of being contaminated with

- (a) any of the biological agents mentioned in Article 2(d) groups 3 and 4 or identified through the procedure set out in article 3 of the Council Directive (90/679/EEC) of 26 November 1990 on the protection of workers from risks related to exposure to biological agents at work or
- (b) with other viable biological agents artificially cultivated to significantly elevated numbers.

**Note: The definition of “infectious” given above is now out-dated. The list of biological agents and groupings has changed. Furthermore, the introduction of the ADR Regulations into Irish law effectively over-rides the earlier definition. The ADR Regulations on the Transportation of Dangerous Goods by Road and other Modal Regulations refer to two categories of infectious substances; Category A, regarded as higher risk in terms of their ability to cause serious disease on exposure, while Category B includes all other infectious substances. The most recent ADR Regulations were published in 2009. See Section 5.*

Table 2.2 Categories of Healthcare Waste

<i>Potentially Infectious Waste</i>	
1. General	<ul style="list-style-type: none"> a) Blood and items visibly soiled with blood b) Contaminated waste from patients with transmissible infectious diseases c) Incontinence wear/nappies from patients with known or suspected enteric pathogens d) Items contaminated with body fluids other than faeces, urine or breast milk e) Other healthcare infectious waste
2. Laboratory waste	<ul style="list-style-type: none"> f) Specimens and potentially infectious waste from pathology departments g) Microbiological cultures (liquid or solid media in which organisms have been artificially cultivated) h) Other laboratory waste
3. Biological	<ul style="list-style-type: none"> i) Anatomical waste and identifiable body parts
4. Sharps	<ul style="list-style-type: none"> j) Any object which has been used in the diagnosis, treatment or prevention of disease that is likely to cause a puncture wound or cut to the skin
5. Radioactive waste	Includes materials in excess of authorised clearance levels, classified as radioactive under the General control of Radioactive Substances Order, 1993 (S.I. No. 151 of 1993)
6. Other forms of hazardous healthcare waste	Discarded hazardous chemicals, reagents and toxic or flammable medicines
<i>Non-risk waste</i>	
7. Domestic waste	Includes normal household and catering waste, all non-infectious waste, non-toxic, non-radioactive waste and non-chemical waste
8. Confidential material	Includes shredded waste documents of a confidential nature
9. Medical equipment	Assessed as non-infectious, i.e. not contaminated with blood or hazardous body fluids, e.g. plastic bottles, plastic packaging, etc.
10. Potentially offensive material	Assessed as non-infectious, i.e. not contaminated with blood or hazardous body fluids, e.g. nappies/incontinence wear, stoma bags, etc.

3. Segregation

3.1 General

The management of the healthcare waste by segregation is central to the approach advocated in the Health Services Waste Policy. Segregation at the point of origin, aided by suitable and consistent packaging, is vital in enabling different forms of waste to be handled, transported and disposed of in a manner which is safe and consistent with the nature of the waste. The risk of waste spreading infection is very low when handled properly.

The application of the definitions for the different types of waste already implies the use of informed judgement in categorising and segregating the waste. The first level of segregation involves the division of healthcare waste into "risk" and "non-risk" waste. The second level is between fractions within the risk-waste stream which have distinctly different properties. The latter segregation is necessary for ease of handling, treatment and disposal. Segregation, particularly within the risk-waste stream, should be at the point of generation where the nature of the waste is likely to be best understood.

Health and safety considerations are a primary concern in handling healthcare risk waste and packaging requirements have been developed with handling and transportation principally in mind. Segregation within healthcare risk waste, therefore, in the first instance, should be on the basis of packaging requirements appropriate to safe containment of the particular waste. Thereafter, the packaging can be distinguished by different means, e.g. colour coding, which ensures that the waste is readily streamed in accordance with the intended method of disposal.

3.2 Non-Risk Waste

The majority of healthcare waste - arguably well in excess of 80% - is non-risk waste.

The term non-risk is used to distinguish the waste from waste which has a defined risk. It does not imply that the waste is without risk, particularly if it is carelessly handled.

Arrangements, outside the scope of these guidelines, which conform to the requirements of the local waste authority, should be agreed for its disposal. Generally, there are no particular requirements for segregation within the non-risk waste stream but particular recycling schemes or special local packaging arrangements may involve a degree of further segregation. It should be noted that certain waste materials such as incontinence wear, urinary drainage bags etc. which is assessed as non-infectious, are not classified as healthcare risk waste.

3.3 Healthcare Risk Waste

Experience has shown that about 95% of the healthcare risk fraction of waste from hospitals can be satisfactorily treated by non-incineration disinfection technology. Once properly packaged, the bulk of the waste can be presented for collection in a single stream and a distinction need only be made for the remaining 5%, or so. The latter fraction includes, amongst other things, materials such as recognisable large anatomical waste or body parts, cytotoxic materials, blood or blood components assessed as likely to contain transmissible spongiform encephalopathy agents, toxic or flammable pharmaceutical or medicinal products

and large metallic objects, such as prosthetic joints, which are incompatible with the shredding requirement employed in non-incineration technology processes.

4. Packaging

4.1 General

The aim of good waste packaging is to ensure that little or no hazard is presented to personnel involved in handling, transporting or disposing of the waste. Packaging must also satisfy the requirements of various authorities with particular statutory concerns about aspects of waste generation, handling and disposal.

4.2 Packaging of Non-Risk Waste

The majority of non-risk waste is of a domestic nature and requires no specific packaging measures. It is disposed of as domestic or commercial waste, usually in black plastic sacks, bins, skips or containers. The further processing of domestic type waste, including the retrieval of recoverable fractions, compaction etc. is outside the scope of this document, which deals primarily with healthcare risk waste. Also included in this category are those wastes which, while assessed as non-infectious, may be regarded as potentially offensive. Such material, from an infection control perspective, does not need any special treatment or packaging prior to disposal. In some instances, arrangements for disposal may need to be agreed with the local waste authority. The packaging used for such waste should be appropriate and should take account of the potential offence to personnel involved in its transport and disposal.

4.3 Packaging of Healthcare Risk Waste

Two different types of packagings are used for healthcare risk waste, bags or sacks, and rigid containers in the form of bins or sharps boxes. The bags are made of plastic film or, sometimes, plastic or wax-coated paper. Rigid containers are generally made from plastic but corrugated cardboard is also used. The bags are used to hold soft materials **that do not contain sharp objects or liquids**. Rigid containers are used for other forms of waste and for waste containing small amounts of free liquids. Rigid containers are also used for infectious substances and other risk wastes, such as used sharps, pharmaceuticals/ cytotoxic material etc. which may be inherently hazardous. Identifiable anatomical material, such as organs, recognisable body parts placentas and other such wastes containing liquid, must be packaged in robust rigid leak-proof containers that contain sufficient absorbent material to prevent leakage.

To meet the aim of protecting personnel the packaging shall conform to an appropriate specification satisfying minimum requirements for leak resistance, strength, penetration and tear resistance. There may also be special demands on packaging which are dependent on the treatment and disposal method used. Under no circumstances should healthcare risk waste be compacted, either manually or mechanically.

Packaging requirements are directly related to the classification of the waste. In the case of healthcare waste, some of the materials contained are classified as “dangerous goods” and, for transport purposes, come within the scope of the ADR Agreement and the Carriage of Dangerous Goods by Road Regulations, 2007 (S.I. No. 288 of 2007). The Agreement and specific requirements for packaging are outlined in the **section 5** and also in **Appendix 3**. An outline of a preferred packaging system which should meet the legally mandatory packaging requirements is given in **section 6**.

5. Transportation

5.1 Regulations

The transportation of healthcare risk waste is governed by several sets of regulations dealing with different concerns relating to the materials transported. The main regulations are:

- The Carriage of Dangerous Good by Road Act 1998 (no. 43 of 1988)
- The Carriage of Dangerous Good by Road Regulations, 2007 (S.I. No. 288/289 of 2007)
- S.I. No. 147 of 1998 – Waste Management (Movement of Hazardous Waste) Regulations, 1998
- The Waste Management (Collection Permit) Regulations, 2007 (S.I. No. 820 of 2007)

Rules aimed at improving safety in the transportation of all types of dangerous goods have been agreed internationally for different modes of transport. These set down very specific requirements for the classification, packagings, labelling and documentation of dangerous goods as well as the training of personnel involved in the transport of such dangerous goods. Some forms of healthcare waste are included in the dangerous substances classification.

Irish domestic legislation giving effect to the European Agreement Concerning the International Transport of Dangerous Goods by Road (ADR) was enacted in 1998 by the Carriage of Dangerous Goods by Road Act - (No. 43 of 1998). Current regulations made under the 1998 Act are the Carriage of Dangerous Goods by Road Regulations 2007 (due to be updated in 2011).

Similar, but not identical, rules apply to the carriage of dangerous goods by other modes of transport. Where the waste is being shipped abroad, by sea, the transport must also comply with the International Maritime Dangerous Goods (IMDG) Code. Similarly, transport by rail must conform to the International Carriage of Dangerous Goods by Rail (RID) and transport by air, the International Civil Aviation Organisation (ICAO) Technical Instructions.

5.1.1 S.I. No. 288 of 2007 Provisions

The detailed Irish regulations implementing ADR are set out in S.I. No. 288 of 2007. The Regulations apply to the carriage in tanks, in bulk and in packages, of dangerous goods by road; including the packing, loading, filling and unloading of the dangerous goods in relation to their carriage. Partly due to the complexity of the legislative requirements in this area,

anyone involved in the transport of dangerous goods may require the appointment of a Safety Adviser. Provision is made in the Regulations for the appointment of such an Adviser.

The Regulations impose duties on the various participants associated with the carriage of the dangerous goods. They contain requirements for the vehicles, tanks, tank containers, receptacles and packages containing the dangerous goods during their carriage. They require that the drivers and others, involved in the carriage of the dangerous goods by road (including their packing/loading/filling/transport/unloading) be adequately trained and, in the case of drivers, hold certificates of such. The Regulations also contain provisions on an EC harmonised approach to the road checks aspect of their enforcement.

The requirements are given in eleven parts as follows:

Part 1	Preliminary – outlining the application and scope
Part 2	Compliance with ADR
Part 3	Duties of participants
Part 4	Duties of vehicle crew
Part 5	Driver training certificate courses
Part 6	Vehicle technical inspections
Part 7	Road checks
Part 8	Security provisions
Part 9	Safety Advisers and serious accidents/incident reports
Part 10	Exemptions
Part 11	Application of section 18 of Act

In addition, the Regulations include a number of schedules and forms.

Part 2 imposes the obligation to comply with the Annexes of ADR.

These state that:

- The dangerous goods must be packed in accordance with the provisions and special conditions of packing, marking and danger labels specified for each ADR class in Annex A to the ADR;
- The packaging, including Intermediate Bulk Containers (IBC), Large Packagings (LP) etc. must be so closed as to preclude any loss of contents;
- The packaging must be unaffected by the contents or the conditions of transport;
- The packaging must conform to the provisions of ADR relating to design, construction, type approval, inspection, maintenance, operation, filling and use;
- The packaging must be marked and labelled in accordance with ADR

The packaging requirements make up a major part of ADR and are dealt with in **5.2** below and in **Appendix 3**.

Part 3 and 4 deal with the duties of participants is the most relevant section to health establishments generating, managing and transporting healthcare risk waste. In Part 3, duties and responsibilities are described in detail for different participants most of which are relevant to healthcare risk waste. The participants listed include:

- consignor
- carrier
- consignee
- loader
- packer
- filler
- tank-container operator
- driver
- vehicle crew

Anyone with responsibility for any of the above activities or personnel involved in such activities should obtain a copy of and be familiar with the detailed requirements of the Regulations.

The other sections in the regulations deal with requirements which are largely the responsibility of the carrier. However, the consignor is responsible, under the regulations, for ensuring compliance with the mode of carriage stipulated in the ADR.

It should be noted that the consignor, under the Regulations, is required to complete a transport document which must accompany the load containing a specified list of information relating to the consignment. (A consignment note containing information about the goods to be conveyed is also required under other regulations - **see Section 5.1.3**. For transport within Ireland, it is acceptable to use a single form which satisfies the combined requirements. The information provided must be given in a format which meets the specific requirements contained in each set of regulations). The driver must also carry INSTRUCTIONS IN WRITING, to be implemented in the event of an accident. The instructions must meet the requirements of ADR.

5.1.2 Safety Adviser³

The Carriage of Dangerous Goods by Road Regulations S.I. 288 of 2007 place an obligation on an “undertaking” to appoint a Safety Adviser. The Adviser is responsible for helping to prevent the risks inherent in such activities with regard to persons, property and the environment. An undertaking means a person who transports, or is involved in the filling, packaging, loading or unloading of dangerous goods transported by road. While healthcare risk waste generators principal involvement is as consignors, invariably, they are involved in filling of packages and wheeled bins or large packaging and as such, are required to employ a Safety Adviser. The appointed Adviser must be qualified in accordance with the Regulations. The appointment may be either on the basis of a specifically engaged outside consultant or of a suitably qualified employee. In any case, the arrangement should be agreed by both parties, in writing.

³ The Safety Adviser requirement replaces the obligation to have access to a Dangerous Goods Safety Adviser (DGSA) as per the DGSA Regulations, S.I. No. 6 of 2001, in so far as they apply to the carriage of dangerous goods by road (but not rail). For practical purposes, the term Safety Adviser and DGSA are synonymous.

Part of the appointed safety adviser duties include the preparation of an annual report and each undertaking is required to retain the report for at least 5 years and must make the report available to the competent authority (Health & Safety Authority HSA) when requested.

5.1.3 Consignment Notes – C1 Form

S.I. No. 147 of 1998 – Waste Management (Movement of Hazardous Waste) Regulations, 1998 stipulates that the consignor (producer or holder) of any hazardous waste being transported off site has to complete a consignment note which must accompany the waste during carriage. The waste is also required to be transported in properly labelled packaging. The consignment note system is intended to enable the local authorities to keep track of the movement of hazardous wastes at all stages from production to disposal.

The consignment note is issued by the local waste authority in whose functional area the waste originates. The consignment note is in three parts, A, B and C, and comprises 5 bound and numbered copies. The consignor is obliged to complete Part A and give the top four copies to the carrier. The carrier, in turn completes Part B before finally passing the consignment note to the consignee who must return the form to the local authority after completing Part C.

A Consignment Note must be raised for each shipment of infectious healthcare risk waste. The note must accompany the load at all stages of carriage.

Note: For transport by road, within Ireland, the information provided in the C1 Form should satisfy the obligation of the consignor to provide a transport document under the Carriage of Dangerous Goods by Road Regulations, provided all the information required in the latter Regulations is included and is stated in the format stipulated. Where the waste is being shipped abroad, separate documentation is necessary.

An example of a C1 Form, completed in a manner which should satisfy the Carriage of Dangerous Goods by Road Regulations 2007, is given in **Appendix 5**.

Note:

NEW WASTE TRANSFER FORM SYSTEM 2011

It is expected that new legislation will be introduced in 2011 making Dublin City Council, National TFS Office, sole authority for the administration of Waste Transfer Forms (WTF). These will replace the current C1 Form system. The fundamental change to the current C1 system is the move to an online system which will discontinue the requirement to retain paper records of waste movements. It is expected that this should reduce the administrative burden for those shipping the same type of waste regularly e.g. healthcare risk waste. It is also expected that pick-ups from multiple locations will be permitted on a single WTF Form. That being the case, it may become necessary to use separate consignment notes containing the required ADR information for each site visited in addition in order to satisfy the Carriage of Dangerous Goods Regulations.

5.1.4 Waste Management (Collection Permit) Regulations, 2007

Most forms of waste collection on a commercial basis are subject to Regional or National Waste Collection Permits. The permits are issued by the regional waste authorities under the Waste Management (Collection Permit) Regulations, 2007 (S.I. No. 820 of 2007). The regulations allow the waste authorities to monitor and control carriers and the movement of waste. The process of issuing permits allows for public consultation. In practice, Collection Permits are now issued, on behalf of the other authorities, by Dublin City Council.

5.2 Detailed ADR Transport Provisions

5.2.1 Classification

The ADR Agreement sets out detailed provisions for the classification, packaging, labelling, documentation and transport of all classes of dangerous goods.

The basis of ADR is the classification of dangerous substances into 9 different classes according to the type of hazard involved. The ADR provisions are set out in two annexes, A and B, which are updated regularly.⁴ Annex A contains general provisions and provisions concerning the 9 classes of dangerous substances and articles (e.g. classification, packaging, labelling and documentation). Annex B contains provisions concerning transport equipment and transport operations (e.g. requirements for vehicle crews, equipment, operation and requirements concerning the construction and approval of vehicles).

A detailed and extensive classification of dangerous substances is given in the “Dangerous Goods List” in Annex A. The list details substances in order of the 4-digit “UN Number” which is allocated to each dangerous substance followed by the Proper Shipping Name (PSN) for each substance. By consulting the Dangerous Goods List with the UN Number of the particular substance in question, the applicable transport requirements can be ascertained.

The principal class of substance relevant to healthcare risk waste is Class 6.2 – infectious substances. A small number of items from other classes may also be relevant e.g. Class 6.1 - toxic substances, Class 3 – flammable liquids and so on.

It is a legal duty on consignors of dangerous goods to classify those substances in accordance with ADR. This is achieved by adhering to this guidance and with the support as necessary of a Safety Adviser.

5.2.1.1 Class 6.1 Toxic substances

Class 6.1, toxic substances, covers a range of substances of varying degrees of toxicity which can cause damage to human health or death by inhalation, by cutaneous absorption or by ingestion. In the field of patient-care this class has a limited relevance.

ADR includes provisions for medicines that are classified as follows:

UN1851, medicine, liquid, toxic – class 6.1 toxic liquid

UN3249, medicine, solid, Toxic, NOS – class 6.1 toxic solid substances

Also note there is an entry in ADR for medicine which is classified as a flammable liquid - class 3:

UN3248, medicine, liquid, flammable, toxic, NOS – class 3 flammable liquid with subsidiary toxic hazard

⁴ The most recent amendments are contained in the 1 January 2009 ADR although S.I. 288 of 2007 specifically relates to the 2007 ADR. The full text of ADR2009 is available at the United Nations Economic Commission for Europe website: <http://www.unece.org/trans/danger/danger.htm>.

The above UN numbers apply in each case to two levels of packaging – II and III. III corresponds to a low level of hazard. Cytotoxic and cytostatic medicines, EWC entry 180108, are included in the hazardous waste list of the EWC.

The classification of substances that may be considered toxic is complicated and should be done with the assistance of the Safety Adviser.

(Note: Toxic substances that do not exceed specified toxic concentrations are not subject to ADR and may be transported as “un-regulated” waste unless they meet the criteria for inclusion in another class of dangerous goods. It should be noted, however, that they may still be considered as environmentally harmful and their disposal to landfill is often excluded from the operator’s facility licence.)

Toxic chemicals and solvents used in health-related laboratories or in special processes carried out in some hospital departments should be treated separately from healthcare risk waste.

5.2.1.2 Class 6.2 Infectious substances

Class 6.2, infectious substances, comprises of those substances known or reasonably expected to contain pathogens. Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsiae, parasites, fungi) and other agents such as prions, which can cause infectious disease in humans or animals.

Under ADR infectious substances are subject to this class only if they are capable of spreading disease. They are not subject to this class if they are unlikely to cause disease.

Substances of Class 6.2 are subdivided as follows:

- I1 - UN 2814 INFECTIOUS SUBSTANCE, AFFECTING HUMANS
- I2 - UN 2900 INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only
- I3 - UN 3291 CLINICAL WASTE
- I4 - UN 3373 BIOLOGICAL SUBSTANCES

Articles contaminated with these substances are also considered as substances of this class.

Infectious substances are divided into the following categories:

- Category A
- Category B

Category A

An infectious substance which is known or suspected to be contaminated with pathogens presenting the most severe risk of infection is classified as a Category A. Category A waste includes infectious waste from highly infectious diseases such as Ebola virus and cultures from certain infectious diseases such as *Clostridium botulinum* and *hepatitis B virus*. Other examples of Category A microorganisms are given in Appendix 3.

With the exception of certain laboratory wastes very little Category A waste will be produced from healthcare premises in Ireland.

- Infectious substances meeting these criteria which cause disease in humans or both humans and animals shall be assigned to UN2814.
- Infectious substances which cause disease only in animals shall be assigned UN No. 2900.

(Note: Category A waste arising in hospitals and laboratories should be sterilised by autoclaving at source. Normal practice is for such waste then to be disposed of in the clinical waste stream as UN 3291.)

Category B

An infectious substance which does not meet the criteria for inclusion in Category A.

Infectious waste in Category B shall be assigned to UN No. 3291.

The vast majority of infectious waste produced from the healthcare sector will be classified as Category B – UN3291.

Medical or clinical wastes are defined under ADR as *wastes derived from the medical treatment of animals or humans or from bio-research*. For the purpose of these guidelines, this is taken as corresponding to the definition of healthcare waste quoted in Table 2.1.

Medical or clinical wastes which are reasonably believed to have a low probability of containing infectious substances shall be assigned to UN3291.

Notwithstanding this classification, medical or clinical wastes assigned to EWC 180104 (180203) are not subject to the provisions of ADR.

Medical or clinical wastes assigned to number 18 01 04 (Wastes from human or animal health care and/or related research – wastes from natal care, diagnosis, treatment or prevention of disease in humans – wastes whose collection and disposal is not subject to special requirements in order to prevent infection) or 18 02 03 (Wastes from human or animal health care and/or related research – wastes from research, diagnosis, treatment or prevention of disease involving animals – wastes whose collection and disposal is not subject to special requirements in order to prevent infection) according to the list of wastes annexed to the Commission Decision 2000/532/EC as amended, are not subject to the provisions of ADR.

Decontaminated medical or clinical wastes which previously contained infectious substances are not subject to the provisions of ADR unless they meet the criteria for inclusion in another class.

5.2.1.3 Classification of other Dangerous Goods

Other dangerous goods wastes that cannot be classified as clinical waste must be assigned to the most appropriate entry in ADR. All such wastes must be assessed in conjunction with the Safety Adviser.

Examples may include:

Waste dental amalgam – this may contain mercury, if that is the case this must be assigned to UN2025, mercury compounds, solid, NOS, 6.1 PGIII.

Waste aerosols must be assigned to – UN1950, aerosols, class 2

The appropriate entry must be applied to all substances considered dangerous for transport.

5.2.2 UN Approved Packagings

UN approved packagings must be used for the transportation of the substances listed in the Dangerous Goods List (unless otherwise specified in ADR). All packaging must be appropriate for the type of waste conveyed and must be designed to prevent leakage of the contents during normal conditions of transport. In addition, the packaging must be unaffected by the contents and must conform to provisions set down relating to design and construction. Each container intended for use as UN packaging must bear a permanent mark relevant to the container type. The mark is the manufacturer's certification that the mass produced container corresponds to the approved design and test specified by ADR. ADR also sets down the materials that can be used and the test standard to be achieved.

5.2.2.1 Packaging Requirements for Class 6.2 – Infectious Substances

Waste transported as Category B (UN3291) shall meet the requirements of packing instructions P621 of the ADR – reproduced in **Appendix 3**.

Waste transported as Category A (UN2814 or UN 2900) shall meet the requirements of packing instruction ADR P620 – reproduced in **Appendix 3**.

5.2.2.2 Packagings Requirements for class 6.1 – Toxic substances

Waste medicine assigned to UN1851 and UN 3249 shall meet the requirements of packing instructions ADR P001 and P002 respectively – refer to ADR and Safety Adviser.

5.2.2.3 Packagings Requirements for class 3 (6.1) – Flammable (toxic)

Waste medicine assigned to UN3248 shall meet the requirements of packing instruction ADR P001 – refer to ADR and Safety Adviser.

5.2.2.3 Packagings requirements for other dangerous goods

Packagings requirements for other dangerous goods shall meet the requirements of the appropriate packing instruction in accordance with ADR.

Refer to appropriate detailed guidance and/or obtain advice of Safety Adviser.

5.2.3 Labelling

Each outer container intended for use as UN packaging must carry a specific diamond-shaped hazard label (class 6.2 label example below) and further marking giving specific information about the contents. For Class 6.2 the hazard label must include the biohazard symbol and the

class number, **6**. The hazard label may also include the text “*Infectious material. In case of damage or leakage immediately notify Public Health Authority*”. The diamond hazard label must have minimum side dimensions of 100mm x 100mm. A smaller label is permissible only where the container is not large enough to accommodate the 100mm label provided it remains clearly visible. The information marking must contain the 4-digit UN number, including the letters UN, of the product contained, e.g. “**UN 3291**”, and should include the Proper Shipping Name (PSN) as listed in the ADR Dangerous Goods List where IMDG (marine transport) or other regulations apply such as when the goods are being shipped abroad.



ADR class 6.2 infectious substance label

6. Waste Management and Packaging System

6.1 General

The collection and transport method used traditionally involved two different types of packagings for healthcare risk waste, viz. bags or sacks, and rigid containers, bins or boxes. Practice now is, generally, to transport these items within wheeled bins. This system works well, when appropriately managed. Accordingly, the guidance put forward in this document promotes the continuation, as far as possible, of the system, with some modifications to ensure that the system can be operated in conformity with ADR. It is not permissible to compact healthcare risk waste, either manually or mechanically.

Any system of containment of healthcare risk waste for transportation must conform to the detailed requirements of ADR outlined in **section 5**. These requirements can be summarised briefly as follows:

- ◆ Chemicals or pharmaceuticals, other than small amounts present as contaminants or residues in healthcare risk waste, should be separately classified and carried in UN approved containers designed for solids or liquids as appropriate, bearing the appropriate UN number, (proper shipping name if shipped abroad) ,hazard label and specified information about the contents.
- ◆ Infectious waste material belonging to Category B (UN3291) of Class 6.2, as a minimum, must be packaged in a rigid UN approved container (bin or box) designed for solids or liquids as appropriate, bearing the classification number “6”, the appropriate UN number, (proper shipping name if shipped abroad) and the bio-hazard danger label with specified information about the contents. Absorbent material, sufficient to absorb any spills, must be used if the solid waste contains small quantities of liquid.
- ◆ Infectious material belonging to Category A (UN2814) of Class 6.2 should be autoclaved on site prior to transport as category B (UN3291) waste as above. (Category A infectious waste may be transported without prior treatment only provided the packagings complies with Packagings Instruction ADR P620.)

Note: Infectious waste may not be packed together with other goods except those added as coolants e.g. ice, dry ice or refrigerated liquid nitrogen.

The use of Class 6.1 toxic substances should always be under professional supervision. Specialist advice and the advice of a Safety Adviser should be obtained on the packagings, labelling, and the preparation of transport documentation appropriate to the disposal of waste containing such substances. An informed judgement may have to be made in the case of healthcare waste, contaminated with, or containing traces, of such substances. Empty packagings with residues for all of the substances in this or other classes are also subject to ADR. Again, the advice of the Safety Adviser should be obtained.

The vast majority of clinical/healthcare risk waste falls into the lower risk containment category – Category B (UN3291).

Due regard should be had to the consequences of using inadequate or inappropriate packaging. As well as being potentially damaging to personnel and the environment the use of such packaging is in breach of statutory regulations. Such occurrences could result in prosecution of the consignor and may result in delays and the return, at the producer's expense, of the waste concerned.

UN approved plastic sacks or bags, used for soft dry materials (i.e. excluding sharps), will now conform to ADR requirements only if they are contained in an outer packaging, such as a wheeled bin approved as a rigid IBC (Intermediate Bulk Container) or large packaging. In such cases the wheeled bin, rather than the bag, becomes the primary container and while the waste may be moved in bags internally within the hospital it must be contained within the wheeled bin for transport off site. For safety, on-site movement of bags should also be within wheeled bins where practicable.

All containers must be appropriate for the type of waste to be conveyed. Particular attention should be paid to wastes which may be difficult to convey, such as liquids. In general, most healthcare risk waste can be considered as solid waste. Small quantities of liquids or substances which have a high liquid content are acceptable within the waste if each of the following requirements is met:

- a) The liquid is further contained in an inner packaging so that it is unlikely to spill or leak e.g. in bags, bottles and a liner is employed within the rigid container.
- b) In the event of spillage there is sufficient absorbent material to soak up the liquid.
- c) The lid is properly fitted and makes the container leak-proof.

Where larger quantities of free healthcare risk waste liquids need to be transported for treatment leak-proof containment together with absorbent material is required. In such cases the advice of the Safety Adviser should be sought and the arrangements agreed in advance with the waste disposal contractor. Liquid waste **must not be placed in plastic bags** where it is likely to leak in handling.

6.2 General requirements for all packaging

All containers, including wheeled bins carrying bagged waste, should conform to basic requirements relating to:

- Manufacture
- Colour coding
- Labelling
- Filling
- Closure
- Traceability

Manufacture: Annex A of the ADR sets out the requirements for the packing of dangerous goods. All packagings, including Intermediate Bulk Containers (IBCs) and large packagings (wheeled bins), used for the transport of dangerous goods must be manufactured and tested to approved UN standards and must pass the testing regime set out in the ADR specification.

Colour Coding: A system of colour coding is not a UN/ADR requirement but is highly desirable to assist in segregation and management of the waste. The basic colour put forward for the body of each type of container is yellow. This has become common usage in most countries. For manufacturing reasons, wheeled bin bodies may, by agreement, be of a different colour.

Lid colours are used to indicate the disposal stream.

- **Yellow** (yellow) lids should be used with containers for disposal by non-incineration, disinfection technology.
- **Red** (red) or **blue** (blue) lids are sometimes used by manufacturers to distinguish sharps containers and are also acceptable for alternative technology disposal (but see note re containers for un-regulated medicinal wastes in 6.4.1.3).
- **Purple** (purple) or **black** (black) lids are reserved for containers intended principally for disposal by incineration.
- **Purple** (purple) lids are recommended for bins or boxes with healthcare risk waste contaminated with cytotoxic materials discarded medicines or pharmaceuticals.
- **Black** (black) lids are recommended for containers used for the disposal of recognisable large anatomical waste material or body parts, including placentas. Such containers may also be used for other materials which are not suitable for disposal by alternative technology and for which the proper disposal method is deemed to be incineration.

Labelling: As well as the information required by ADR – hazard label, class number, 6, UN number etc. information should be included about the contents and recommended method of disposal, e.g. “HEALTHCARE RISK WASTE - FOR CONTROLLED DISPOSAL” or “CYTOTOXIC HEALTHCARE RISK WASTE – FOR DISPOSAL BY INCINERATION ONLY”.

Filling: Containers must not be over-filled. Containers with an excess of waste cannot be closed without risk to the personnel involved. The contents may also spill in handling or transportation. Improperly closed containers leave the waste exposed thus increasing the potential for security or vermin problems. To assist in this area some bins have manufacturer’s fill lines beyond which the container should not be filled. In general rigid boxes should not be more than three-quarters filled while bags should not be more than two-thirds filled. The latter is necessary to aid closure of the bags. Wheeled bins must not be filled beyond the point where closure of the lid is obstructed or causes the contents to be squashed.

Closure: The integrity of any packaging during handling and transportation is critically dependent on the proper sealing or closure of the packaging. It is essential that lids to UN containers are fitted and closed in accordance with the manufacturer’s recommendations. Their certification is on the basis of properly closed lids. Plastic bags should be closed using one of a number of different methods. These include “swan-necking” and tying with either tape or a cable-tie or the straight use of a cable-tie or some other proprietary clip. Where wheeled bins are employed it is essential that the lids are locked during storage and transportation. Only good quality locks should be used with minimal projections which could snag bags being placed in the bins.

Traceability: All waste packages must be tagged with a unique reference number which is traceable to the point of production. Proprietary closure ties which incorporate a

reference number system are now extensively used. Each healthcare waste generator should retain records of tags issued to particular locations for a recommended period of not less than three years. In case of incident this will allow each package to be traced to the actual producer.

6.3 Packaging Types

Table 6.1 lists the different types of packagings approved under ADR for use with clinical/healthcare risk waste. In addition to the containers listed in Table 6.1, bags or rigid containers specifically suited for autoclaving should be used to contain laboratory slides and cultures or other materials prior to sterilisation.

Table 6.1 – Recommended Packaging Types

	<u>CONTAINER TYPE</u>	<u>UN MARK*</u>
(a)	Yellow bags (for disposal by non-incineration disinfection technology)	5H4
(b)	Yellow rigid packagings - bins or boxes - (for disposal by non-incineration disinfection technology)	1H2 3H2 4H2
(c)	Yellow sharps packagings (for disposal by non-incineration disinfection technology)	4H2Y
(d)	Yellow rigid packagings with purple lids (for disposal by Incineration only)	1H2 3H2 4H2
(e)	Yellow rigid packagings with black lids (for large anatomical waste - for disposal by Incineration)	1H2 3H2 4H2
(f)	Yellow ⁺ reusable eurocart-type wheeled bins approved as an IBC or large packaging ⁺ Colour may vary by agreement	31H2 or 50 for Large Packaging
(g)	ADR tanks or tank vehicles	S4AH or L4BH

***Note:** All packagings for clinical/healthcare risk waste must be marked “Y” designating the packing group (degree of danger), Y packagings being suitable for packing groups II and III. The higher standard “X” may also be used, but “Z” packagings may not be used. Medical or clinical wastes assigned to UN3291 are assigned to packing group II (medium danger).

Typical marking printed or embossed on UN approved packaging:

4H2/Y/S..... plastic box for solids
 1H2/Y/S..... removable head plastic drum for solids
 1H2/Y1.4/150 as above but for liquids

5H4/Y * /S..... plastic bag, * max weight of container or bag in kg

It should be noted that **containers are approved on the basis of a maximum weight of contents and that this weight must not be exceeded.** (If in doubt, the Safety Adviser should be consulted.)

Containers manufactured to other UN marks may also comply with the ADR requirements for Class 6.1 and Class 6.2 – for further clarification consult with Safety Adviser.

Note on the use of wheeled bins:

The use of eurocart-type wheeled bins for the internal movement of healthcare risk waste is seen as the best way to avoid unnecessary secondary handling of primary containers. In addition, the wheeled bins act as an extra containment or outer packaging. As plastic sacks or bags are not permissible as primary containers under ADR the wheeled bin, rather than the bag, has to be considered the primary container for transport purposes. In such cases, the wheeled bin must display the required ADR marking and hazard labels appropriate to an IBC (on two opposite sides) or Large Packaging. Only wheeled bins that have been UN tested specifically for the type of waste to be conveyed should be used.⁵ They must not be used with loose waste inside.

As wheeled bins are in constant re-use and may be returned to an internal hospital environment it is imperative that they be maintained to a high standard of cleanliness. **Bins, once emptied, must be fully washed and disinfected, internally and externally, prior to re-entering the distribution system.** This will generally be the responsibility of the contractor. The cleaned bins ideally should be kept segregated, in transport and storage, from bins containing waste for treatment. This is particularly important in situations where the bins are to be used in sub-collection areas within the hospital. Contaminated empty wheeled bins constitute empty packaging under ADR and are subject to the provisions of ADR.

All wheeled bins must be identifiable by means of a unique number and a bar-code or electronic tag system to allow easy monitoring of the bins.

Note on the use of ADR tanks or tank vehicles:

ADR tanks or tank vehicles consisting of approved liquid retaining steel or reinforced plastic tanks which can be hermetically sealed are now used to transport UN 3291 waste in bulk within the U.K. To date, there is no experience of using such tanks in Ireland.

6.4 Contents and Segregation

⁵ Most tests carried out, to date, on wheeled bins, involve waste which is already contained within UN approved plastic bags. Consequently, the use of such wheeled bins will conform to UN container requirements only when the waste is contained in such bags. A closed lid is an integral part of the wheeled bin during testing so, to ensure compliance, it is essential that the lid is properly locked at all times during transportation.

Details of the typical contents appropriate to each container type are set out in diagrammatic form in **Figure 6.1**. The Figure also illustrates some typical non-risk waste items under the heading “black bag waste”. The figure was developed in conjunction with the Infection Control Nurses Association, Irish Regional Group.

A more detailed segregation and packaging table and notes is given in **Appendix 2** *and should be consulted by health service personnel, particularly those involved in the more acute end of healthcare.*

It is important for correct context that the figures and the text of this entire document are read together.

Figure 6.1

SEGREGATION OF HEALTHCARE WASTE⁺ - typical contents

<p>YELLOW BAG</p> <ul style="list-style-type: none"> ◆ ALL BLOOD-STAINED OR CONTAMINATED ITEMS INCLUDING:- DRESSINGS, SWABS, BANDAGES, PERSONAL PROTECTIVE EQUIPMENT (GOWNS, APRONS, GLOVES) ◆ SUCTION CATHETERS, TUBING AND WOUND DRAINS ◆ INCONTINENCE WASTE FROM KNOWN OR SUSPECTED ENTERIC INFECTIONS <p><i>NB. BAGS MUST NOT BE USED FOR SHARP ITEMS, BREAKABLE ITEMS OR LIQUIDS</i></p> <p>DO NOT OVERFILL.</p> <p><u>BAG MUST BE SECURELY CLOSED WITH CABLE TIE OR TAPE WHEN 2/3 FULL</u> <u>MAXIMUM</u></p>	<p>YELLOW RIGID BIN OR BOX WITH YELLOW LID</p> <ul style="list-style-type: none"> ◆ BLOOD AND BLOOD ADMINISTRATION SETS ◆ BODY FLUIDS (not in bulk) <i>SEE NOTE RE LIQUIDS BELOW</i> ◆ DISPOSABLE SUCTION LINERS ◆ REDIVAC DRAINS ◆ BIOLOGICAL HISTOLOGY WASTE ◆ NON-CULTURED LAB WASTE & AUTOCLAVED MICROBIOLOGICAL CULTURES ◆ SPUTUM CONTAINERS FROM KNOWN OR SUSPECTED TB CASES <p>DO NOT OVERFILL.</p> <p><u>BOX MUST BE SECURELY CLOSED WHEN AT MAXIMUM 3/4 FULL OR AT MANUFACTURER'S FILL LINE</u></p>	<p>YELLOW SHARPS BIN OR BOX</p> <p>USED SHARP MATERIALS SUCH AS:</p> <ul style="list-style-type: none"> ◆ NEEDLES ◆ SYRINGES ◆ SCALPELS ◆ SHARP TIPS OF I.V. SETS ◆ CONTAMINATED SLIDES ◆ BLOOD-STAINED OR CONTAMINATED GLASS ◆ STITCH CUTTERS ◆ GUIDE WIRES/TROCHARS ◆ RAZORS <p>DO NOT OVERFILL</p> <p>NOT FOR LIQUIDS</p> <p><u>BOX MUST BE SECURELY CLOSED WHEN AT MAXIMUM 3/4 FULL OR, AT MANUFACTURER'S FILL LINE</u></p>	<p>YELLOW RIGID BIN OR BOX WITH PURPLE LID</p> <ul style="list-style-type: none"> ◆ NON-SHARPS HEALTHCARE WASTE CONTAMINATED WITH CYTOTOXIC/CYTOSTATIC MEDICINES OR OTHER TOXIC PHARMACEUTICAL PRODUCTS <p><i>SEE NOTE REGARDING LIQUIDS BELOW</i></p> <p>DO NOT OVERFILL</p> <p><u>BOX MUST BE SECURELY CLOSED WHEN AT MAXIMUM 3/4 FULL OR, AT MANUFACTURER'S FILL LINE</u></p>	<p>YELLOW SHARPS BIN OR BOX WITH PURPLE LID</p> <ul style="list-style-type: none"> ◆ NEEDLES, SYRINGES, SHARP INSTRUMENTS AND BROKEN GLASS CONTAMINATED WITH CYTOTOXIC/CYTOSTATIC MEDICINES OR OTHER TOXIC PHARMACEUTICAL PRODUCTS <p>DO NOT OVERFILL</p> <p>NOT FOR LIQUIDS</p> <p><u>BOX MUST BE SECURELY CLOSED WHEN AT MAXIMUM 3/4 FULL OR, AT MANUFACTURER'S FILL LINE</u></p>	<p>YELLOW RIGID BIN OR BOX WITH BLACK LID</p> <ul style="list-style-type: none"> ◆ PLACENTAS (SEE NOTE BELOW RE ABSORBENT MATERIAL) ◆ LARGE ANATOMICAL BODY PARTS ◆ WASTE CONTAINING BSE/TSE RELATED BLOOD OR TISSUE ◆ CONTAMINATED LARGE METAL OBJECTS (SEE 6.4.1.1.4) <p>DO NOT OVERFILL</p> <p><u>BOX MUST BE SECURELY CLOSED WHEN AT MAXIMUM 3/4 FULL OR, AT MANUFACTURER'S FILL LINE</u></p>
<p>LIQUIDS: Dangerous Goods Regulations require the use of absorbent material or gelling agent to prevent any spillages from UN packaging containing healthcare risk waste involving free liquids unless the container is specifically approved for liquids. All significant quantities of liquid must be in "leak-proof"</p>		<p>YELLOW RIGID BIN OR BOX WITH BLUE LID⁴</p> <ul style="list-style-type: none"> ◆ UN-REGULATED MEDICINAL/PHARMACEUTICAL SUBSTANCES i.e. products not classified as DANGEROUS GOODS under ADR Regulations <p>Note: These waste substances are best managed by returning them for disposal to the pharmacy in their original packaging.</p> <p><i>If the products belong to a different "dangerous goods" class e.g. toxic or flammable solids, liquids or aerosols, they must be packaged and labelled in accordance with their classification and entry in ADR as instructed by the Safety Adviser.</i></p>	<p>BLACK BAG* - FOR NON-RISK WASTE</p> <ul style="list-style-type: none"> ◆ INCONTINENCE WEAR (from non-infectious patients) ◆ OXYGEN FACE MASKS ◆ EMPTY URINARY DRAINAGE BAGS ◆ CLEAR TUBING (e.g. oxygen, urinary catheters, ventilator, I.V., N.G.) ◆ ENTERIC FEEDING BAGS ◆ GIVING SETS WITH TIPS REMOVED ◆ ALL OTHER HOUSEHOLD NON-RECYCLABLE WASTE <p>DO NOT OVERFILL</p>		

Notes: (1) All bags and containers must have an individual tracing tag or label.

(2) ⁺ Containers, marking and labels for healthcare risk waste must conform to ADR requirements.

(3)* Some Waste Authorities may require healthcare non-risk waste to be packaged in clear, or otherwise identified plastic bags

(4) Blue (or grey) lidded containers are suggested for this stream - see 6.4.1.3 and related footnote

6.4.1 Notes on specific requirements regarding some containers:

6.4.1.1 Rigid Containers: There are two types of container: *rigid plastic boxes* and *sharps bins*, each with distinctive lids to indicate the waste disposal stream to which they should be assigned.

Note 1: Most rigid UN containers used for healthcare risk waste are not leak-proof and are not approved for the containment of free liquids. Where small quantities of liquid are contained in the waste it is crucial that absorbent material is added sufficient to fully absorb the liquid in the event of the liquid spilling within the container. Liquid waste must be placed in UN approved leak-proof containers.

Note 2: Individual container types and sizes are approved on the basis of specific contents and maximum weights. If the weight limit is exceeded the container will not comply with ADR.

6.4.1.1.1 Rigid box with yellow lid: *Permissible Contents* - material containing small quantities of liquids i.e. quantities that can be readily absorbed by the other contents of the package, low-risk laboratory wastes and autoclaved cultures (but not sharp objects capable of puncturing the walls of the container), bagged blood, plasma, blood products, blood components (*but see Note 1 above*), small histology specimens (drained of formaldehyde solution). They shall not contain cytotoxic waste, free liquids, pharmaceutical/medicinal waste, large identifiable anatomical parts or waste containing blood or tissue from BSE/TSE infected patients.

6.4.1.1.2 Sharps Box: Sharps bins must be constructed of materials which are impenetrable to glass or sharp edged objects. *Permissible Contents* – Contaminated sharps such as used needles and syringes, scalpels, sharp tips of IV sets and blood stained or contaminated glass etc.

Note 1: Ordinary non-clinical glassware or other uncontaminated used glassware should not be disposed of as healthcare risk waste sharps.

6.4.1.1.3 Rigid box with purple lid: *Permissible Contents* - Non-sharps healthcare waste contaminated with cytotoxic/cytostatic medicines, chemicals or pharmaceuticals.

Note (i): Clinical/healthcare waste from human healthcare contaminated with chemicals, medicines or pharmaceuticals which are not classified as dangerous goods and are neither ecotoxic nor occupationally hazardous may be disposed of as general healthcare risk waste.

Note (ii): Unused or out of date medicines or pharmaceuticals normally should be returned to the pharmacy for classification, packaging and disposal. If the content is such that the waste items are classified as dangerous goods for transport purposes they must be labelled and packaged in accordance with the specific hazard contained in the waste.

Note (iii): Any waste controlled drugs should be returned to the pharmacy under the same handling, accountability and security conditions that apply to the issuing of such substances. The management and treatment of waste controlled drugs is outside the scope of this guideline.

Method of disposal:- The method of disposal shall be by incineration only at a temperature in accordance with recommendations (manufacturer's/statutory) for the disposal of the contents.

6.4.1.1.4 Rigid box with black lid: *Permissible Contents* - recognisable anatomical waste or body parts, placentas, un-autoclaved Category B cultures, blood or blood components assessed as being likely to contain BSE/TSE agents, contaminated large metal objects (which cannot be shredded and where no other form of recovery is available).

Method of disposal:- For large amputations the disposal arrangements should be made having regard to the patient's wishes. For all other waste the method of disposal shall be by arrangement with the disposal contractor but generally shall be by incineration.

6.4.1.2 Autoclave bags: *Type:* Light blue or clear with appropriate blue lettering. *Permissible Contents* - autoclave bags shall be used for the containment of laboratory waste to be autoclaved. Some form of rigid container or holder may need to be used in combination with, or as an alternative, to the bags, where the autoclaved waste involves glassware.

Method of disposal:- The primary container, after autoclaving, shall be yellow bags, rigid boxes or sharps container, as appropriate.

6.4.1.3 Rigid box with blue lid⁶: This type of container is suggested for un-regulated waste medicinal or pharmaceutical products i.e. products that do not meet the criteria for inclusion in the list of classified dangerous substances under ADR. If the products belong to a different “dangerous goods” class e.g. toxic/flammable solids, liquids or aerosols, or if they are infectious waste they must be packaged and labelled in accordance with their classification and entry in ADR as instructed by the Safety Adviser.

To guard against the risk of chemical reactions, when mixed, it is important that un-used medicines of this type i.e. not toxic, flammable or dangerous aerosol, should be kept in the original consumer packaging.

N.B. Care must be exercised to ensure that this type of container is not used for the disposal of clinical waste such as used sharps or other infectious waste and they must never be used to dispose of waste cytotoxic or cytostatic medicines or material so contaminated.

Method of disposal: Waste medicines, other than cytotoxic or cytostatic medicines, are not categorised as hazardous waste in the European Waste Catalogue. In practice, however, they may be viewed as environmentally hazardous for disposal purposes and, as such, they may be considered unsuitable for disposal to landfill. Currently, these wastes are sent abroad for incineration. The criteria to be satisfied for packaging should be agreed with the contractor responsible for disposal. The shipment of waste of this type is subject to Transfrontier Shipment Regulations and it is important that only properly licensed contractors are employed to dispose of such waste.

⁶ Blue lidded containers are suggested for un-regulated medicinal waste. (If there is a danger of confusion due to the use in some areas of blue lids for sharps bins, then grey lids are suggested for un-regulated medicinal waste.) This waste will generally consist of unused medicines in their original consumer packaging. The container should be robust but does not have to be UN approved. Where UN approved containers are used, it is important that they are not marked with a UN number or hazard label. To avoid confusion, it may be prudent to specifically label the container as “unregulated waste”.

6.5 The Management of Other Potentially Hazardous Wastes

Other hazardous waste arising from specialist processes carried out in the hospital environment should be separated and controlled by the personnel responsible for the processes. The disposal of such wastes should be by arrangement with a hazardous waste contractor in consultation with the Safety Adviser and should conform to the requirements of hazardous waste regulations.

Transportation and packaging must conform to ADR. Any such wastes must be pre-advised to the contractor and the packaging and disposal arrangements should be agreed between the consignor, carrier and consignee prior to collection.

Examples of other waste types which may be classified as hazardous waste or as dangerous goods include:

- Large contaminated items
- Dental amalgam⁷
- Surgical implant devices
- Flammable toxic medicines
- Toxic medicine (solids/liquids)
- Other chemicals derived from laboratories or from other processes - detergents, cleaning materials
- Waste batteries
- Waste aerosols
- Radio active waste

The list is not exhaustive.

Note: In certain circumstances the consignment of some of these substances may qualify for certain exemptions under the transport of dangerous goods by road legislation, e.g. limited quantities. The safety Adviser should be consulted on these matters.

Wastes which contain solvents, concentrated iodine or, mercury⁸, must be segregated, identified, quantified and separately marked as they may require different processing by the contractor. Specialist advice and the advice of the Safety Adviser should be obtained regarding the actual concentrations at which such measures are required.

The disposal of radioactive wastes must be in accordance with the terms and conditions of the licence issued to the hospital by the Radiological Protection Institute of Ireland (RPII). Packaging and transport must conform to the requirements of Class 7 of ADR for which the RPII is the competent authority. Wastes, for disposal, which contain low levels of radioactive materials must be segregated, identified and carry certification on the form and level of radioactivity present. This certification must be provided by a competent person.

⁷ This Guideline does not encompass waste from dental practices. It should be noted that such waste includes waste amalgam, amalgam sludge and amalgam filters on suction units as well as extracted teeth with amalgam filters and must be segregated from other healthcare risk waste for separate classification and disposal in UN containers containing the appropriate class 6.1 toxic label and UN Number.

⁸ Due regard should be had to any recommendations in circulation for the elimination of mercury from use in clinical practice where there is a suitable alternative.

Other forms of waste, not mentioned, should be identified and approved, individually, prior to collection.

6.6 Laboratory Waste

It is essential that good laboratory procedures apply to the management, packaging and handling of all wastes generated in laboratories. Comprehensive waste management procedures should form an important part of any laboratory operating procedures. These should be spelled out in detail in the Laboratory Safety Management Plan.

Where considered necessary for the prevention of disease laboratory waste should be autoclaved prior to disposal. In any event, laboratory waste containing Category A microorganisms must be autoclaved prior to disposal. It is important that suitably qualified personnel who understand the nature of the infectious materials as well as the health and safety implications involved in the handling, packaging and treatment of the waste are involved in the assessment.

Facilities unable to pre-treat category A infectious material must seek the advice from a Safety Adviser prior to moving this material off site. Specialist packaging, labelling, documentation and handling is necessary.

Under no circumstances should glassware such as bottles, slides, pipettes etc. be placed in plastic bags even if autoclaved beforehand.

6.7 Transmissible Spongiform Encephalopathy Agents

In cases where waste is likely to contain blood or tissue from a patient who is known or suspected to have CJD or a related disorder i.e. those with clinical symptoms, and those who are potentially at risk of developing the disease, the waste should be placed in the appropriate black-lidded container for disposal by incineration.

6.8 Pharmacy Waste

The management of waste generated in a hospital/community pharmacy is primarily the responsibility of the pharmacist in charge.

The wastes include out-of-date pharmaceuticals/medicines, left-over medicinal products returned from wards and clinics and residues from making up preparations. Waste medicines, other than cytotoxic or cytostatic medicines, are not categorised as hazardous waste in the European Waste Catalogue. However, some wastes from the pharmacy may include substances which are hazardous in the context of disposal or which are classified as dangerous goods for the purpose of packaging and transportation under ADR.

Many of these substances originate in the wards. Best practice suggests that where such wastes are generated outside the pharmacy, they should be returned to the pharmacy in their original consumer packaging, where possible, for classification and packaging prior to disposal.

ADR includes provisions for medicines that are classified as follows:

<u>Waste type</u>	<u>U.N. No.</u>	<u>Information required on label</u>	<u>Quantity limits – net per bin</u>
Medicine, liquid, toxic	UN1851	MEDICINE, LIQUID, TOXIC, N.O.S. Class 6.1, UN 1851	5 litres
Medicine, solid, toxic	UN 3249	MEDICINE, SOLID, TOXIC, N.O.S. Class 6.1, UN 3249	5 kg.
Medicine, liquid, flammable	UN 3248	MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S. Class 3, UN 3248	5 litres

Note that the UN 3248 entry is for medicine which is classified as a flammable liquid - class 3, with subsidiary toxic hazard

Aerosols and inhalers: Waste aerosols (including inhalers), where the product or the propellant is hazardous, must be assigned to – UN1950, aerosols, class 2. Limited quantities may apply. These should not be packed with other pharmacy waste. Breath activated inhalers are not encompassed by Class 2.

Toxic chemicals and solvents must be separately classified, labelled and packaged. Separate suitable containers will be required for each of the UN numbers above. The ADR requirements for storage and transportation are complicated as they take account of the potential for reactions between some dangerous substances. Consequently, it is imperative that the classification, packaging and consignment process be carried out in accordance with the recommendations of the Safety Adviser.

For disposal of un-regulated medicinal wastes – see 6.4.1.3.

7. Storage & Handling of Healthcare Waste on Site

7.1 General

Storage on-site normally consists of waste sub-collection stations or areas dispersed throughout the hospital and a central waste store or marshalling yard to which all streams of the hospital's waste are periodically brought.

Healthcare risk waste (clinical waste UN3291) should generally be conveyed to the waste marshalling area in locked yellow wheeled bins for storage prior to collection. Under no circumstances should healthcare risk waste be compacted, either manually or mechanically.

Domestic type waste may also be brought to the marshalling area for tipping and compaction into appropriate compactor containers/skips. **It is imperative that, in such cases, that the two waste streams are not mixed or conveyed together.**

After permanent sealing and tagging primary healthcare risk waste packaging should be stored in the designated sub-collection area at the point of origin (e.g. ward, clinic) until collection. Primary healthcare risk waste packages must not be stored loose in corridors or other locations accessible to unauthorised personnel. Wheeled bins should be parked with brakes on, in the designated healthcare risk waste storage area so that primary healthcare waste packages can be placed in them directly after sealing and tagging.

Note: *For fire safety reasons, care should be taken not to locate containers in corridors or escape routes.*

7.2 Storing Wheeled Bins at On-Site Facilities or Collection Points

7.2.1 Central Waste Store/Waste Marshalling Yard

A central waste store or depot and related facilities should be provided for waste pending final removal for disposal. It should not be accessible to the public. Appropriate warning signs indicating the presence of healthcare risk waste/bio-hazard, restricting access to the public, should be prominently displayed at all entrances to any storage area.

The facilities for healthcare risk waste should include:

- Well ventilated, covered storage area for filled healthcare risk waste wheeled bins
- Separate covered storage area for clean healthcare risk waste bins prior to distribution
- A secure ventilated room for the storage of hazardous and other sensitive waste. This room may need to be equipped with a freezer cabinet for the storage of large anatomical items.

The waste marshalling area should be equipped with spillage kits and washing/cleaning and disinfection facilities for dealing with spillages etc. as well as all necessary services including lighting. Drainage, gradients and surfaces shall be such as to facilitate washing and cleaning.

Storage areas should conform to the following:-

- a) well drained impervious hard standing
- b) enclosed compound with lockable gates
- c) secure from interference by unauthorised persons, children or animals
- d) easily accessible to collection vehicles.

The storage area should have sufficient capacity for the frequency of collection including a margin for any interruption in the collection/disposal system or accumulations during public holidays or missed collections. Wheeled bins should be stored with the lids closed, when empty and locked when full.

The storage of healthcare waste should be for as short a time as practical. Specialist forms of storage, such as freezers or temperature-controlled stores are not normally necessary and should only be considered where collection frequencies are such that the waste could give rise to offence and/or a nuisance.

7.2.2 Waste Collection Stations

In larger hospitals it may be appropriate to use a number of sub-collection stations or areas as intermediate collection points. Where collection stations are provided, they should be in the form of dedicated rooms which serve, on a shared basis, the short-term waste storage requirements of a number of departments. They may be used for the storage of both domestic, or household waste, and healthcare risk waste, but where this is the case, the healthcare risk waste containers should be kept separated from the domestic waste. Waste brought to the collection stations in plastic bags, rigid boxes and other containers will normally be transferred into wheeled bins in the collection station.

The stations should have easy access to the outside for the purpose of transferring wheeled bins to the waste marshalling yard. Access should be limited to staff by means of a keypad or combination type lock. An appropriate bio-hazard warning notice should be prominently displayed at the entrance. The area should be well lit and have washable walls and floors which are resistant to detergents and disinfectants.

Wheeled bins containing waste must be locked when full or are stored in any location which is not under direct supervision or is accessible to the public. Wheeled bins with faulty locks, physical damage or are not marked appropriately (“UN 3291” and class 6.1 – infectious substances hazard label) must not be used.

7.3 Record Maintenance

A record of the tags or tracers issued to each hospital department should be retained within the hospital, ideally, for a period of not less than three years. The record should include details of the date and ward or department where the container has been used.

Each consignment of waste must be tracked for contract and invoicing purposes and the consignment documentation should show the details of each bin, by number/bar-code for each collection. This record must be maintained, not only for invoicing and account purposes, but also as a record for the purpose of traceability and accountability.

On despatch of healthcare risk waste, the hospital, as consignor of Dangerous Goods, must complete the transport document required under the Carriage of Dangerous Goods by Road Regulations as well as the C1 Form required by the Waste Management (Movement of hazardous Waste) Regulations. For transport within Ireland the use of a combined single form is preferable. If a single combined form is used the details inserted in the C1 Form should comply with **section 5.1.3** and **Appendix 5**. Copies of the document/s must be retained by the hospital in accordance with the requirements of the regulations for a period of 5 years.

7.4 Frequency of Collection

The frequency of collection of healthcare waste should be arranged as necessary to ensure that:

- a) waste is stored no longer than necessary or appropriate at the point of origin
- b) sub-collection storage areas are always cleared before becoming over-filled
- c) good control is exercised over healthcare risk waste in storage and that a “first-in-first-out” system of bin rotation is applied.

8. Health & Safety

Healthcare employers have responsibilities to employees in relation to the management and handling of healthcare waste under general Health & Safety legislation and under ADR. Under the Safety, Health & Welfare at Work Act 2005 there is a requirement to identify and assess risks in the workplace and to make every effort to reduce and eliminate such risks. Employers are obliged to equip and train personnel to deal properly with hazards. In the hospital or healthcare environment different staff will require different levels of training. It is important that this training is function specific.

The Safety Statement drawn up in accordance with Safety, Health and Welfare at Work regulations must include an identification of potential hazards and a proper risk assessment. It should also include a comprehensive Health & Safety Policy which deals with:

- responsibilities of named persons
- identification of the Safety Adviser/s
- safety control measures
- written safety procedures
- health and safety training
- auditing of procedures
- consultation between all concerned personnel, management and employees
- accident, ill-health and incident recording and reports

Clearly, there are risks associated with the handling of healthcare risk waste and it is incumbent on healthcare employers to include detailed provisions in the Safety Statement relating to the health and safety aspects of healthcare risk waste.

The Statement should include details relating to:

- training and information
- the provision of personal protective equipment (PPE)
- training in the use of PPE
- personal hygiene
- hygiene facilities
- accident, ill-health and incident procedures & records

Personnel working within hospitals, involved in healthcare waste handling and movement, should be under the control of properly trained supervisors. They should receive sufficient training on the nature of healthcare risk waste and on its handling, segregation and packaging to enable them to meet the aims of proper waste management and to safely carry out their work. They should also be trained in the use of personal protective equipment and spillage kits. A record should be maintained and kept up to date of the training received.

Sufficient and appropriate training, information and instructions should be given to personnel involved in the handling of healthcare risk waste. Specifically this should address:

- potential risks to health
- precautions to be taken
- hygiene requirements
- the use of personal protective equipment and clothing
- steps to be taken in the case of incidents and to prevent incidents

The training should be given at the beginning of work and should be repeated periodically, e.g. annually, and adapted to take account of new or changed procedures or circumstances. In addition appropriate training in manual handling procedures should be provided to personnel placing healthcare risk waste containers into wheeled bins. It is important, in the choice of containers to be used that due regard should be had to the density of the waste and any recommended weight/height lift limits.

The precise personal protective equipment to be provided is dependent on the risk assessment. Where manual handling is involved heavy duty or even armoured gloves may be necessary if needlestick injuries are likely to occur.

The safety procedures and training for staff whose principal duties involve waste handling and movement should include instruction on the cleaning of spillages and the proper and safe use of equipment, bleaches and disinfectants. The handling of toxic chemicals should be restricted to personnel whose training qualifies them to deal with any incidents that could occur.

APPENDIX 1.

The Guidelines below were drawn up by the Infection Control Nurses Association, Irish Regional Group, and the Irish Society of Clinical Microbiologists in 1999. It should be noted that some of the definitions used in this Appendix differ somewhat from those used in the main document. The definitions in the main document have been updated on a number of occasions to reflect changes in transport regulations. The differences do not seriously affect the use of the Appendix for the purpose of categorisation.

Guidelines for the Categorisation of Healthcare Waste.

Healthcare Waste

¹This is defined as solid or liquid waste arising from healthcare or health related facilities.

Categories of Healthcare Waste

- A. Healthcare Risk Waste**
- B. Healthcare Non-Risk Waste**

A:Healthcare Risk Waste

This is categorised as risk waste, which is potentially hazardous to those who come in contact with it, by nature of its infectious, biological, chemical or radioactive content, or by being categorised as a sharp.

1. Infectious Waste

Two overlapping definitions apply:

(a) ²Any Healthcare waste known or clinically assessed to be at risk of being contaminated with any of the biological agents, mentioned in article 2(d) group 3 and 4 of Council Directive 90/679/EEC on the protection of workers from risks related to exposure to biological agents at work. *

(b) ³Any waste arising from healthcare containing "substances contaminated with viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms". **

1.1 General:

- a) Blood, and any items visibly soiled with blood, e.g. blood giving sets and bags, wound dressings, wound drains, swabs, disposable aprons, gloves and gowns that are blood stained.
- b) Contaminated waste from patients with transmissible infectious diseases e.g. suction catheters, tissues or sputum containers from patients with Tuberculosis.
- c) Incontinence wear/nappies from patients with known or suspected enteric pathogens e.g. rotavirus or salmonella.

- d) Items contaminated with body fluids other than faeces, urine or breast milk, i.e. pus, sputum, or peritoneal fluid. Examples include suction containers, suction tubing and other suction related equipment, and thoraseal drains.
- e) Other healthcare infectious waste from treatment areas as covered by definition of Infectious Waste.

1.2 Microbiological cultures, specimens and potentially infectious waste from **Pathology departments** (laboratory, post mortem rooms, or research laboratories).

2. Biological

Anatomical Waste i.e. all human tissue, organs, body parts, carcasses and animals used for medical tests or research, it includes leeches and worms.

3. Sharps

Categorised as any object that has been used in the diagnosis, treatment or prevention of disease and that is likely to cause a puncture wound or cut to the skin. Examples include used needles, scalpels, razors, lancets, contaminated broken glass, guidewires, sharp tips of clear intravenous giving sets, stitch cutters or any other contaminated disposable sharp instrument or item.

4. Radioactive waste

Waste which includes materials, in excess of authorized clearance levels, classified as radioactive under the General Control of Radioactive Substances Order, 1993, (S.I. No. 151 of 1993).

5. Chemical Waste

Discarded chemicals and medicines.

B: Healthcare Non-Risk Waste

This is categorised as non-risk waste, which is not hazardous to those who come in contact with it. Its contents are non infectious, non radioactive or non chemical.

1. Domestic Waste

This includes normal household and catering waste, all non-infectious waste, non-toxic, non-radioactive waste, and non-chemical waste. Examples include flowers, office waste, paper hand towels, wrapping paper, cardboard, newspapers, aerosol canisters and cans.

2. Confidential Material

This includes shredded waste documents of a confidential nature. Examples include patient notes and laboratory results.

3. Medical Equipment

Which is assessed as non-infectious, i.e. not contaminated with blood or hazardous body fluids or as described in Section 1. Examples include plastic items, plastic bottles, plastic packaging, IV solution fluid bags and sets excluding sharp tips, ventilator and oxygen tubing, oxygen facemasks, enteral feeding bags and administration sets.

4. Potentially Offensive Material

Which is assessed as non-infectious, i.e. not contaminated with blood or hazardous body fluids or as described in Section 1. Examples include nappies/incontinence wear, stoma bags, urinary drainage bags and tubing, urinary catheters, naso-gastric tubes, unless visibly contaminated with blood.

NOTE: *The above categories of waste (B 1 - 4) do not present as an infectious risk to those who handle them and are suitable for land fill, provided they are secured appropriately.*

Disposal

Category A Waste: 1 – 3 must be rendered non-infectious or non-hazardous prior to their final disposal. These items need to be examined on a case by case basis.

4 – 5 as per relevant regulations and licence conditions, where appropriate

Category B Waste: Suitable for landfill.

(N.B. The category A & B waste referred to here are not those described in Section 5.2.1.2)

References

- 1 Analysis of Priority Waste Streams, Healthcare Waste Commission of the European Communities, May 1995
- 2 Health Services Waste Policy June 1994, Department of Health
- 3 Waste Management Act 1996 and Waste Catalogue and Hazardous Waste List, Environmental Protection Agency, pg. 5, 23, 27

* Council Directive of 26th November 1990 on Protection of Workers (90/679/E.E.C.)

Infectious waste is defined as being any healthcare waste known or clinically accessed to be at risk with any of the biological agents mentioned in Article 2(d) groups 3 and 4 of the council directive (90/679/E.E.C.)¹ of the 26th November 1990 on the protection of workers from risks related to exposure to biological agents at work of article 16(1) of Directive 89/391 EEC or with any other **viable** biological agents artificially cultivated to significantly elevated numbers.

Council Directive 90/679/E.E.C.² defines a group 3 biological agent as meaning: -

“one that can cause severe human disease and present a serious hazard to workers; it may present a risk of spreading to the community, but there is usually an effective prophylaxis or treatment available.”

A group 4 biological agent means: -

“one that causes severe human disease and is a serious hazard to workers; it may present a high risk of spreading to the community; there is usually no effective prophylaxis or treatment”

The biological agents that are excluded from the definition as infectious waste are groups 1 and 2 biological agents. Group 1 being: -

“one that is unlikely to cause human disease”

While group 2 is defined as

“one that can cause human disease and might be a hazard to workers, it is unlikely to spread to the community; there is usually an effective prophylaxis or treatment available.”

Note: Council Directive 90/679/EEC has been amended by Directives 95/30/EC, 97/59/EC and 97/65/EC, each amending the list of biological agents.

**** Council Directive of 12th December 1991 on Hazardous Waste (91/689 EEC).**

Annex I:

Categories of generic types of hazardous waste listed according to their nature or the activity, which generated them. (Waste may be liquid sludge or solid in form).

e.g. Annex I.A

Waste displaying any of the properties listed in Annex III and which consist of:

- a) Anatomical substances, hospital and other clinical wastes.
- b) Pharmaceutical, medicines and veterinary components and chemical substances arising from research and development or teaching activities which are not identified and/or new and those whose effects on man and/or the environment are not known (e.g. laboratory residues etc.)

Annex II:

Constituents of the wastes in Annex I.B which render them hazardous when they have the properties described in Annex III, e.g. C33 pharmaceutical or veterinary compounds, C35 Infectious Substances.

Examples of Annex I.B of Annex I: Materials resulting from selective waste collections from households and which exhibit any of the characteristics listed in Annex III.

Annex III:

Properties of wastes which render them hazardous, H.9 "Infectious".

Relevant reading material

Council Decision (94/904 EEC) Established a list of hazardous waste pursuant to article 1(4) of Council Directive 91/689 EEC on hazardous waste.

Relevant References for Department of Health Definition: Adopted from the Priority Waste Stream Project Group's definition.

Council Directive 93/88 EEC of 12th December 1993.

Safety, Health and Welfare at Work (Biological Agents) Regulations, 1994 (S.I. No. 146 of 1994) and subsequent amendment, S.I. No. 248 of 1998.

APPENDIX 2

Detailed Segregation and Packaging Table

Designated containers which are appropriate should be provided for the disposal of different waste types. Details of these and typical contents appropriate to each container are set out in tabular form in **Table A1**.

It is important that the text of the entire document and the table are read together.

Table A1, page 1 HEALTHCARE RISK WASTE - PREFERRED PACKAGING

Container	1. Yellow Bags	2. Yellow Rigid Bins or Boxes with Yellow Lids	3. Yellow Sharps Bins or Boxes
Container type and Colour	Yellow, non-halogenated plastic, +400 gauge minimum, conforming to UN mark 5H4.	Yellow rigid box/bin with yellow sealable lids. Conforming to UN approved box/bin, type 1H2, 3H2 or 4H2 and marked accordingly.	Yellow rigid puncture-resistant box/bin. Conforming to UN approved box/bin, type 1H2, 3H2 or 4H2 and marked accordingly.
Usage	Single use. Suspended in a rigid holder, while filling, or as an inner liner to a rigid box. Suitable on its own only for low-risk dry soft waste. When so used, transportation must be in conjunction with UN approved wheeled bin.	Single use. For solids and, where small quantities of liquids are contained in the waste, absorbent material must be added sufficient to fully absorb the liquid. Liquid waste to be contained in leak-proof containers.	Single use.
Filling and Closure	Bags to be securely closed when, at maximum, 2/3 full using proprietary cable tie or tape. Do not overfill.	Securable yellow lid - ¾ filled maximum or to manufacturer's fill line, if one is present. Do not overfill.	Securable lid - ¾ filled maximum or to manufacturer's fill line, if one is present. Do not overfill.
Labelling	UN number (UN3291), diamond shaped risk label with class number "6" and biohazard symbol. Additional labelling should read: "HEALTHCARE RISK WASTE - FOR CONTROLLED DISPOSAL"	UN number (UN3291 or *UN2814), diamond shaped risk label with class number "6" and biohazard symbol. Additional labelling should read: "HEALTHCARE RISK WASTE - FOR CONTROLLED DISPOSAL"	UN number (UN3291 or *UN2814), diamond shaped risk label with class number "6" and biohazard symbol. Additional labelling should read: "HEALTHCARE RISK WASTE - FOR CONTROLLED DISPOSAL"
Proper Shipping Name	Clinical waste unspecified, N.O.S.	UN3291 – "Clinical waste unspecified, N.O.S." or UN2814 – "Infectious substances affecting humans".	UN3291 – "Clinical waste unspecified, N.O.S." or UN2814 – "Infectious substances affecting humans".
ADR Packing Instructions	P621 N.B. Yellow bags must be contained within UN approved wheeled bins when transported off-site.	P621 for UN3291 or *P620 for Category A UN2814.	P621 for UN3291 or *P620 for Category A UN2814.
Trace	Cable tie, bar code or other marking tag to enable identification of hospital, ward/centre, and date of filling.	Cable tie, bar code or other marking tag to enable identification of hospital, ward/centre, and date of filling.	Cable tie, bar code or other marking tag to enable identification of hospital, ward/centre, and date of filling.
Typical Contents - categories	Blood-stained or contaminated items including dressings, swabs, bandages, gowns, gloves, tissues, soft disposables etc.	Material containing small volumes of free liquids , laboratory wastes, bagged blood, plasma, or histology waste, Risk Group III isolation facilities waste (subject to further containment), covered protected sharps etc. Note: Laboratory waste containing Category A organisms or in which Category B organisms have multiplied should be autoclaved at source prior to disposal.	Used sharps including all needles and syringes, blood-stained or contaminated glass etc.
Excluded Items	Free liquids, any sharp items capable of puncturing the bag walls, cytotoxic waste, large anatomical waste, chemicals/pharmaceuticals, blood and blood components, large metallic objects such as prosthetic joints etc.	Sharps capable of puncturing the walls of the container, cytotoxic waste, large anatomical waste, chemicals/ pharmaceuticals, blood or blood components assessed as likely to contain TSE agents, large metallic objects such as prosthetic joints etc. Free liquids.	Cytotoxic waste, free liquids, large anatomical waste, chemicals/pharmaceuticals, blood or blood components assessed as likely to contain TSE agents, large metallic objects such as prosthetic joints etc.
Disposal	Alternative Technology	Alternative Technology	Alternative Technology

Note 1: Laboratory waste which has been autoclaved should be streamed for final disposal in yellow bags, rigid boxes or sharps container, as appropriate.

Note 2: This table must be read in conjunction with the Guideline text.

***Category A infectious waste must be consigned as UN2814 (Category B infectious waste is consigned as UN3291).** Category A waste must where possible, be autoclaved on site and then may be consigned as UN3291. If consigning UN2814 follow P620 packing instruction – do not follow UN3291 requirements.

Table A1, page 2 HEALTHCARE RISK WASTE - PREFERRED PACKAGING

<i>Container</i>	<u>4. Yellow Rigid Bins or Boxes with Purple Lids</u>	<u>5. Yellow Sharps Bins or Boxes with Purple Lids</u>	<u>6. Yellow Rigid Bins or Boxes with Black Lids</u>	<u>7. Wheeled Bin</u>
<i>Container type and Colour</i>	Yellow rigid spill-proof box with purple sealable lids. Conforming to UN approved box/bin, type 1H2, 3H2 or 4H2 and marked accordingly.	Yellow rigid puncture-resistant bin/box. Conforming to UN approved box/bin, type 1H2, 3H2 or 4H2 and marked accordingly.	Yellow rigid leak-proof box with black sealable lid. Conforming to UN approved box/bin, type 1H2, 3H2 or 4H2 and marked accordingly.	Yellow UN approved "eurocart" type wheeled bins
<i>Usage</i>	Single use. For solids and, where small quantities of liquids are contained in the waste, absorbent material must be added sufficient to fully absorb the liquid. Liquid waste to be contained in leak-proof containers.	Single use.	Single use. For solids and, where small quantities of liquids are contained in the waste, absorbent material must be added sufficient to fully absorb the liquid. Liquid waste to be contained in leak-proof containers.	Reusable. For holding and transporting closed yellow bags and containers. <i>N.B. Lid to be locked during storage and transportation.</i> <i>Clean bins to be kept separate from filled bins.</i>
<i>Filling and Closure</i>	Securable purple lid - ¾ filled maximum or to manufacturer's fill line, if one is present. <i>Do not overfill.</i>	Securable purple lid - ¾ filled maximum or to manufacturer's fill line, if one is present. <i>Do not overfill.</i>	Securable black lid - ¾ filled maximum or to manufacturer's fill line, if one is present. <i>Do not overfill.</i>	Lockable yellow lid. <i>Do not overfill.</i>
<i>Labelling</i>	UN number (UN3291 or UN2814 for Cat A waste), diamond shaped risk label with class number "6" and biohazard symbol. Additional labelling should read: "CYTOTOXIC/HEALTHCARE RISK WASTE - FOR DISPOSAL BY INCINERATION ONLY"	UN number (UN3291 or UN2814 for Cat A waste), diamond shaped risk label with class number "6" and biohazard symbol. Additional labelling should read: "CYTOTOXIC/HEALTHCARE RISK WASTE - FOR DISPOSAL BY INCINERATION ONLY"	UN number (UN3291 or UN2814 for Cat A waste), diamond shaped risk label with class number "6" and biohazard symbol. Additional labelling should read: "CYTOTOXIC/HEALTHCARE RISK WASTE - FOR DISPOSAL BY INCINERATION ONLY"	UN number (UN3291), diamond shaped risk label with class number "6" and biohazard symbol on 2 opposite sides. Additional labelling should read: "HEALTHCARE RISK WASTE "
<i>PSN</i>	UN3291 – "Clinical waste unspecified, N.O.S." or UN2814 – "Infectious substances affecting humans".	UN3291 – "Clinical waste unspecified, N.O.S." or UN2814 – "Infectious substances affecting humans".	UN3291 – "Clinical waste unspecified, N.O.S." or UN2814 – "Infectious substances affecting humans".	UN3291 – "Clinical waste unspecified, N.O.S."
<i>Packing Instruction</i>	P621 for UN3291 or *P620 for Category A UN2814.	P621 for UN3291 or *P620 for Category A UN2814.	P621 for UN3291 or *P620 for Category A UN2814.	IBC620 or LP621
<i>Trace</i>	Cable tie, bar code or other marking tag to enable identification of hospital, ward/centre, and date of filling.	Cable tie, bar code or other marking tag to enable identification of hospital, ward/centre, and date of filling.	Cable tie, bar code or other marking tag to enable identification of hospital, ward/centre, and date of filling.	Unique identification number and bar code.
<i>Typical Contents - categories</i>	Non-sharps (including cover protected sharps or sharps tips) cytotoxic contaminated healthcare waste. Also infectious waste contaminated with pharmaceutical preparations or medicines.	Needles, Syringes, Sharp Instruments, Cartridges and Broken Glass which have been used for the administration of Cytotoxic Drugs/medicines.	Recognisable anatomical waste or body parts, blood, blood components or tissue suspected of being contaminated with CJD, non-autoclaved Category B laboratory cultures and associated waste and contaminated large metal objects.	
<i>Excluded Items</i>	Sharps, pharmaceuticals or medicines loose or in original packets. Free liquids.	Free liquids	Free liquids.	
<i>Disposal</i>	Incineration.	Incineration.	By arrangement with contractor but, generally, by incineration.	N.B. must be cleaned and disinfected after use.

Note 1: Laboratory waste which has been autoclaved should be streamed for final disposal in yellow bags, rigid boxes or sharps container, as appropriate.

Note 2: This table must be read in conjunction with the Guideline text.

***Category A infectious waste must be consigned as UN2814 (Category B infectious waste is consigned as UN3291).** Category A waste must where possible, be autoclaved on site and then may be consigned as UN3291. If consigning UN2814 follow P620 packing instruction – do not follow UN3291 requirements.

Note regarding UN No. 3291

Waste under classification code I3, i.e. Clinical Waste, Unspecified, N.O.S. - UN No. 3291, makes up the vast majority of healthcare risk waste. Such waste is generally low-risk.

Waste in this category:

- must be carried in UN approved packagings/containers (see Packing Instructions P621, IBC620 & LP621 in **Appendix 3**)
- the container must conform to Packing Group II and bear the appropriate UN mark demonstrating that it has been manufactured to this standard
- container designed for solids must be leak-proof under normal conditions of carriage and must contain an absorbent if it contains small quantities of liquid.
- Liquid waste under this classification must be transported in UN approved leak-proof containers. These are identifiable by the marking on the container - refer to section 6.3 or consult your Safety Adviser.
- the container must display a specific diamond-shaped hazard label showing the internationally recognised biohazard symbol as well as the appropriate dangerous substance class number: **6**. The label may also carry the wording “Infectious material. In case of accident or leakage contact the local Health Authority”. The diamond hazard label must have minimum side dimensions of 100mm x 100mm. A smaller label is permissible only where the container is not large enough to accommodate the 100mm label provided it remains clearly visible.
- the marking must contain the specified UN number, **UN 3291**.
- the consignment documentation must include details of the waste by name e.g. “UN3291 Clinical waste, Unspecified, N.O.S. 6.2, II,”

Appendix 3 - ADR 2009 & Packing Instructions

The main ADR provisions are set out in two annexes, A and B. Annex A relates to the goods in question while Annex B relates to the vehicles carrying the goods. The annexes are updated regularly.⁹

A detailed classification of dangerous substances is given as a “Dangerous Goods List” in Annex A. The list is given in order of assigned “UN Numbers”. This is further subdivided in the case of some substances. Class 6.2 – infectious substances - is the principal class relevant to the transportation of healthcare waste.

Some extracts on classification and packing instructions, reproduced from ADR 2009, relevant to different packagings for healthcare risk waste are outlined below. *Users requiring detailed knowledge should refer to the full text and/or to the user’s Safety Adviser* – see footnote.

2.2.62 Class 6.2 Infectious substances

2.2.62.1 Criteria

2.2.62.1.1 The heading of Class 6.2 covers infectious substances. For the purposes of ADR, infectious substances are substances known or reasonably expected to contain pathogens. Pathogens are defined as micro-organisms (including bacteria, viruses, rickettsiae, parasites, fungi) and other agents such as prions, which can cause disease in humans or animals.

NOTE 1: Substances referred to above are not subject to the requirements applicable to this Class if they are unlikely to cause human or animal disease.

NOTE 2: Infectious substances are subject to the requirements applicable to this Class only if they are capable of spreading disease to humans or animals when exposure to them occurs.

NOTE 3: Genetically modified microorganisms and organisms, biological products, diagnostic specimens and infected live animals shall be assigned to this Class if they meet the conditions for this Class.

NOTE 4: Toxins from plant, animal or bacterial sources which do not contain any infectious substances or organisms or which are not contained in them are substances of Class 6.1, UN Nos. 3172 or 3462.

2.2.62.1.2 Substances of Class 6.2 are subdivided as follows:

- I1 Infectious substances affecting humans;
- I2 Infectious substances affecting animals only;
- I3 Clinical waste;
- I4 Biological substances.

⁹ The most recent amendments are contained in the 1 January 2009 ADR. The full text of ADR2009 is available at the United Nations Economic Commission for Europe website: <http://www.unece.org/trans/danger/danger.htm>.

Definitions

2.2.62.1.3 For the purposes of ADR,

“*Biological products*” are those products derived from living organisms which are manufactured and distributed in accordance with the requirements of appropriate national authorities, which may have special licensing requirements, and are used either for prevention, treatment, or diagnosis of disease in humans or animals, or for development, experimental or investigational purposes related thereto. They include, but are not limited to, finished or unsafe products such as vaccines;

“*Cultures*” are the result of a process by which pathogens are intentionally propagated. This definition does not include human or animal patient specimens as defined in this paragraph;

“*Genetically modified microorganisms and organisms*” are microorganisms and organisms in which genetic material has been purposely altered through genetic engineering in a way that does not occur naturally;

“*Medical or clinical wastes*” are wastes derived from the medical treatment of animals or humans or from bio-research;

“*Patient specimens*” are human or animal materials, collected directly from humans or animals, including, but not limited to, excreta, secreta, blood and its components, tissue and tissue fluid swabs, and body parts being carried for purposes such as research, diagnosis, investigational activities, disease treatment and prevention.

Classification

2.2.62.1.4 Infectious substances shall be classified in Class 6.2 and assigned to UN Nos. 2814, 2900, 3291 or 3373, as appropriate.

Infectious substances are divided into the following categories:

2.2.62.1.4.1 Category A: An infectious substance which is carried in a form that, when exposure to it occurs, is capable of causing permanent disability, life threatening or fatal disease in otherwise healthy humans or animals. Indicative examples of substances that meet these criteria are given in the table in this paragraph.

NOTE: *An exposure occurs when an infectious substance is released outside of the protective packaging, resulting in physical contact with humans or animals.*

- (a) Infectious substances meeting these criteria which cause disease in humans or both in humans and animals shall be assigned to UN No. 2814. Infectious substances which cause disease only in animals shall be assigned to UN No. 2900;
- (b) Assignment to UN No. 2814 or UN No. 2900 shall be based on the known medical history and symptoms of the source human or animal, endemic local conditions, or professional judgement concerning individual circumstances of the source human or animal.

NOTE 1: *The proper shipping name for UN No. 2814 is “INFECTIOUS SUBSTANCE, AFFECTING HUMANS”. The proper shipping name for UN No. 2900 is “INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only”*

NOTE 2: The following table is not exhaustive. Infectious substances, including new or emerging pathogens, which do not appear in the table but which meet the same criteria shall be assigned to Category A. In addition, if there is doubt as to whether or not a substance meets the criteria it shall be included in Category A.

NOTE 3: In the following table, the microorganisms written in italics are bacteria, mycoplasmas, rickettsia or fungi.

INDICATIVE EXAMPLES OF INFECTIOUS SUBSTANCES INCLUDED IN CATEGORY A IN ANY FORM UNLESS OTHERWISE INDICATED (2.2.62.1.4.1)	
UN Number and Name	Microorganism
UN No. 2814 Infectious substances affecting humans	<i>Bacillus anthracis</i> (cultures only) <i>Brucella abortus</i> (cultures only) <i>Brucella melitensis</i> (cultures only) <i>Brucella suis</i> (cultures only) <i>Burkholderia mallei</i> – <i>Pseudomonas mallei</i> – glanders (cultures only) <i>Burkholderia pseudomallei</i> – <i>Pseudomonas pseudomallei</i> (cultures only) <i>Chlamydia psittaci</i> – avian strains (cultures only) <i>Clostridium botulinum</i> (cultures only) <i>Coccidioides immitis</i> (cultures only) <i>Coxiella burnetii</i> (cultures only) Crimean-Congo haemorrhagic fever virus Dengue virus (cultures only) Eastern equine encephalitis virus (cultures only) <i>Escherichia coli</i> , verotoxigenic (cultures only)* Ebola virus Flexal virus <i>Francisella tularensis</i> (cultures only) Guanarito virus Hantaan virus Hantaviruses causing haemorrhagic fever with renal syndrome Hendra virus Hepatitis B virus (cultures only) Herpes B virus (cultures only) Human immunodeficiency virus (cultures only) Highly pathogenic avian influenza virus (cultures only) Japanese Encephalitis virus (cultures only) Junin virus Kyasanur Forest disease virus Lassa virus Machupo virus Marburg virus Monkeypox virus <i>Mycobacterium tuberculosis</i> (cultures only) * Nipah virus Omsk haemorrhagic fever virus Poliovirus (cultures only) Rabies virus (cultures only) <i>Rickettsia prowazekii</i> (cultures only) <i>Rickettsia rickettsii</i> (cultures only) Rift Valley fever virus (cultures only) Russian spring-summer encephalitis virus (cultures only) Sabia virus <i>Shigella dysenteriae</i> type 1 (cultures only) *

	Tick-borne encephalitis virus (cultures only) Variola virus Venezuelan equine encephalitis virus (cultures only) West Nile virus (cultures only) Yellow fever virus (cultures only) <i>Yersinia pestis</i> (cultures only)
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**Nevertheless, when the cultures are intended for diagnostic or clinical purposes, they may be classified as infectious substances of Category B.*

INDICATIVE EXAMPLES OF INFECTIOUS SUBSTANCES INCLUDED IN CATEGORY A IN ANY FORM UNLESS OTHERWISE INDICATED (2.2.62.1.4.1)	
UN Number and Name	Microorganism
UN No. 2900 Infectious substances affecting humans	African swine fever virus (cultures only) Avian paramyxovirus Type 1 – Velogenic Newcastle disease virus (cultures only) Classical swine fever virus (cultures only) Foot and mouth disease virus (cultures only) Lumpy skin disease virus (cultures only) <i>Mycoplasma mycoides</i> – contagious bovine pleuropneumonia (cultures only) Peste des petits ruminants virus (cultures only) Rinderpest virus (cultures only) Sheep-pox virus (cultures only) Goatpox virus (cultures only) Swine vesicular disease virus (cultures only) Vesicular stomatitis virus (cultures only)

2.2.62.1.4.2 Category B: An infectious substance which does not meet the criteria for inclusion in Category A. Infectious substances in Category B shall be assigned to UN No. 3373.

NOTE: *The proper shipping name of UN No. 3373 is “BIOLOGICAL SUBSTANCE, CATEGORY B”.*

2.2.62.1.5 Exemptions

2.2.62.1.5.1 Substances which do not contain infectious substances which are unlikely to cause disease in humans or animals are not subject to the provisions of ADR unless they meet the criteria for inclusion in another class.

2.2.62.1.5.2 Substances containing microorganisms which are non-pathogenic to humans or animals are not subject to ADR unless they meet the criteria for inclusion in another class.

2.2.62.1.5.3 Substances in a form that any present pathogens have been neutralised or inactivated such that they no longer pose a health risk are not subject to ADR unless they meet the criteria for inclusion in another class.

2.2.62.1.5.4 Substances where the concentration of pathogens is at a level naturally encountered (including foodstuff and water samples) and which are not considered to pose a significant risk of infection are not subject to ADR unless they meet the criteria of inclusion in another class.

2.2.62.1.5.5 Dried blood spots, collected by applying a drop of blood onto absorbent material, or faecal occult blood screening tests and blood or blood components which have been collected for the purposes of transfusion or for the preparation of blood products to be used for transfusion or transplantation and any tissues or organs intended for use in transplantation are not subject to the provisions of ADR.

2.2.62.1.5.6 Human or animal specimens for which there is minimal likelihood that pathogens are present are not subject to ADR if the specimen is carried in a packaging which will prevent any leakage and which is marked with the words “Exempt human specimen” or “Exempt animal specimen”, as appropriate.

The packaging is deemed to comply with the above requirements if it meets the following conditions:

- (a) The packaging consists of three components:
 - (i) a leak-proof primary receptacle(s);
 - (ii) a leak-proof secondary packaging; and
 - (iii) an outer packaging of adequate strength for its capacity, mass and intended use, and with at least one surface having a minimum dimensions of 100mm x 100mm.

- (b) For liquids, absorbent material in sufficient quantity to absorb the entire contents is placed between the primary receptacle(s) and the secondary packaging so that, during carriage, any release or leak of a liquid substance will not reach the outer packaging and will not compromise the integrity of the cushioning material;

- (c) When multiple fragile primary receptacles are placed in a single secondary packaging, they are either individually wrapped or separated to prevent contact between them.

NOTE 1: An element of professional judgement is required to determine if a substance is exempt under the paragraph. That judgement should be based on the known medical history, symptoms and individual circumstances of the source, human or animal, and endemic local conditions. Examples of specimens which may be carried under this paragraph include the blood or urine tests to monitor cholesterol levels, blood glucose levels, hormone levels, or prostate specific antibodies (PSA); those required to monitor organ function such as heart, liver or kidney function for humans or animals with non-infectious diseases, or for therapeutic drug monitoring; those conducted for insurance or employment purposes and are intended to determine the presence of drugs or alcohol; pregnancy test; biopsies to detect cancer; and antibody detection in humans or animals in the absence of any concern for infection (e.g. evaluation of vaccine induced immunity, diagnosis of autoimmune disease. etc.).

NOTE 2: For air transport, packagings for specimens exempted under this paragraph shall meet the conditions in (a) to (c).

2.2.62.1.6 to 2.2.62.1.8 (Reserved)

2.2.62.1.9 Biological products

For the purposes of ADR, biological products are divided into the following groups:

- (a) those which are manufactured and packaged in accordance with the requirements of appropriate national authorities and carried for the purposes of final packaging or distribution, and use for

personal health care by medical professionals or individuals. Substances in this group are not subject to the provisions of ADR;

- (b) those which do not fall under paragraph (a) and are known or reasonably believed to contain infectious substances and which meet the criteria for inclusion in Category A or Category B. Substances in this group shall be assigned to UN Nos. 2814, 2900 or 3372, as appropriate.

NOTE: *Some licensed biological products may present a biohazard only in certain parts of the world. In that case, competent authorities may require these biological products to be in compliance with local requirements for infectious substances or may impose other restrictions.*

2.2.62.1.10 Genetically modified microorganisms and organisms

Genetically modified microorganisms not meeting the definition of infectious substance shall be classified according to section 2.2.9.

2.2.62.1.11 Medical or clinical wastes

- 2.2.62.1.11.1 Medical or clinical wastes containing Category A infectious substances shall be assigned to UN No. 2814 or UN No. 2900 as appropriate. Medical or clinical wastes containing infectious substances in Category B shall be assigned to UN No. 3291.

NOTE : *Medical or clinical wastes assigned to number 180103 (Wastes from human or animal health care and/or related research – wastes from natal care, diagnosis, treatment or prevention of disease in humans – wastes whose collection and disposal is subject to special requirements in order to prevent infection) or 180202 (Wastes from human or animal health care and/or related research – wastes from research, diagnosis, treatment or prevention of disease involving animals – wastes whose collection and disposal is subject to special requirements in order to prevent infection) according to the list of wastes annexed to provisions set out in this paragraph, based on the medical or veterinary diagnosis concerning the patient of the animal.*

- 2.2.62.1.11.2 Medical or clinical wastes which are reasonably believed to have a low probability of containing infectious substances shall be assigned to UN No. 3291. For the assignment, international, regional or national waste catalogues may be taken into account.

NOTE 1: *The proper shipping name for UN No. 3291 is CLINICAL WASTE UNSPECIFIED N.O.S“ or “(BIO) MEDICAL WASTE N.O.S or REGULATED MEDICAL WASTE N.O.S”*

NOTE 2: *Notwithstanding the classification criteria set out above, medical or clinical wastes assigned to number 18 01 04 (Wastes from human or animal health care and/or related research – wastes from natal care, diagnosis, treatment or prevention of disease in humans – wastes whose collection and disposal is not subject to special requirements in order to prevent infection) or 180203 (wastes from human or animal health care and/or related research – wastes from research, diagnosis, treatment or prevention of disease involving animals – wastes whose collection and disposal is not subject to special requirements in order to prevent infection) according to the list of wastes annexed to the requirements*

in order to prevent infection) according to the list of wastes annexed to the Commission Decision 2000/532/EC as amended, are not subject to the provisions of ADR.

2.2.62.1.11.3 Decontaminated medical or clinical wastes which previously contained infectious substances are not subject to the provisions of ADR unless they meet the criteria for inclusion in another class.

2.2.62.1.11.4 Medical or clinical wastes assigned to UN No. 3291 are assigned to packing group II.

2.2.62.1.12 *Infected Animals*

2.2.62.1.12.1 Unless an infectious substance cannot be consigned by any other means, live animals shall not be used to consign such a substance. A live animal which has been intentionally infected and is known or suspected to contain an infectious substance shall only be carried under terms and conditions approved by the competent authority.

2.2.62.1.12.2 Animals affected by pathogens of Category A or by pathogens which would be assigned to Category A in cultures only, shall be assigned to UN 2814 or UN 2900 as appropriate. Animal material affected by pathogens of Category B, other than those which would be assigned to Category A if they were in cultures, shall be assigned to UN 3373.

2.2.62.2 *Substances not accepted for carriage*

Live vertebrate or invertebrate animals shall not be used to carry an infectious agent unless the agent cannot be carried by any other means or unless this carriage has been approved by the competent authority (see 2.2.62.1.12.1).

2.2.62.3 *List of collective entries*

Effects on humans _____	I1	2814	INFECTIOUS SUBSTANCE, AFFECTING HUMANS
Effects on animals only _____	I2	2900	INFECTIOUS SUBSTANCE, AFFECTING ANIMALS only
Clinical waste _____	I3	3291	CLINICAL WASTE, UNSPECIFIED, N.O.S
Biological substances _____	I4	3373	BIOLOGICAL SUBSTANCE, CATEGORY B

Dangerous Goods List -data relating to healthcare waste extracted from ADR2009

UN No.	2814	2900	3291
Name & Description:	Infectious substance, affecting humans	Infectious substance, affecting animals	Clinical waste, unspecified, N.O.S. or regulated medical waste, N.O.S.
Class	6.2	6.2	6.2
Classification	I1	I2	I3
Packing Group			II
Labels	6.2	6.2	6.2
Special provisions*	318	318	565
Limited quantities	LQ0	LQ0	LQ0
Excepted quantities	E0	E0	E0
Tunnel code	E	E	(no tunnel restriction)
Packing	Packing instructions**	P620	P620
	Special packing provisions		
	Mixed packing provisions	MP5	MP5
UN portable tank	Instructions		BK2
	Special provisions		
ADR tank	Tank code		L4BH, S4AH
	Special provisions		TU15, TE19
	Vehicle for tank carriage		AT
	Transport Category	0	0
Special provisions for carriage	Packages		VI
	Bulk		VV11
	Loading, unloading & handling	CV13, CV25, CV26, CV28	CV13, CV25, CV26, CV28
	Operation	S3, S9, S15	S3, S9, S15
	Hazard Identification No.		606

See following pages for explanation of terms highlighted thus - *, **.

The special provisions and packing instructions referred to in the table are reproduced below. The list is incomplete. All references are to ADR 2009. For fuller details refer to ADR 2009 - see footnote at start of appendix.

*** Special Provisions extracted from ADR 2009:**

318 - For the purposes of documentation, the proper shipping name shall be supplemented with the technical name (See 3.1.2.8). When the infectious substances to be carried are unknown, but suspected of meeting the criteria for inclusion in Category A and assignment to Un 2814 or 2900, the words “suspected Category A infectious substance” shall be shown, in parentheses, following the proper shipping name on the transport document.

3.1.2.8 - the provisions referred to, amongst other things, requires the use of the technical name of the goods, in brackets, where the generic or “not otherwise specified” (N.O.S.) proper shipping name is used.

3.1.2.8 - the provisions referred to, amongst other things, requires the use of the technical name of the goods, in brackets, where the generic or “not otherwise specified” (N.O.S.) proper shipping name is used.

565 - Unspecified wastes resulting from medical/veterinary treatment of humans/animals or from biological research, and which are unlikely to contain substances of Class 6.2 shall be assigned to this entry. Decontaminated clinical wastes or wastes resulting from biological research which previously contained infectious substances are not subject to the requirements of Class 6.2.

**** Packing Instructions extracted from ADR 2009:**

P620	PACKING INSTRUCTION	P620
This instruction applies to UN Nos. 2814 and 2900.		
The following packagings are authorized provided the special packing provisions of 4.1.8 are met:		
Packagings meeting the requirements of Chapter 6.3 and approved accordingly consisting of:		
<p>(a) Inner packagings comprising:</p> <ul style="list-style-type: none">(i) leakproof primary receptacle(s);(ii) a leakproof secondary packaging;(iii) other than for solid infectious substances, an absorbent material in sufficient quantity to absorb the entire contents placed between the primary receptacle(s) and the secondary packaging; if multiple primary receptacles are placed in a single secondary packaging, they shall be individually wrapped so as to prevent contact between them; <p>(b) A rigid outer packaging. The smallest external dimension shall be at least 100 mm.</p>		
Additional requirements:		
1. Inner packagings containing infectious substances shall not be consolidated with inner packagings containing unrelated types of goods. Complete packages may be overpacked in accordance with the provisions of 1.2.1 and 5.1.2; such an overpack may contain dry ice.		
2. Other than for exceptional consignments, e.g. whole organs which require special packaging, the following additional requirements shall apply:		
<p>(a) Substances consigned at ambient temperatures or at a higher temperature: Primary receptacles shall be of glass, metal or plastics. Positive means of ensuring a leakproof seal shall be provided, e.g. a heat seal, a skirted stopper or a metal crimp seal. If screw caps are used, they shall be secured by positive means, eg., tape, paraffin sealing tape or manufactured locking closure;</p>		
<p>(b) Substances consigned refrigerated or frozen, ice, dry ice or other refrigerant shall be placed around the secondary packaging(s) or alternatively in an overpack with one or more complete packages marked in accordance with 6.3.3. Interior supports shall be provided to secure secondary packaging(s) or packages in position after the ice or dry ice has dissipated. If ice is used, the outer packaging or overpack shall be leakproof. If dry ice is used, the outer packaging or overpack shall permit the release of carbon dioxide gas. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the refrigerant used;</p>		
<p>(c) Substances consigned in liquid nitrogen. Plastics primary receptacles capable of withstanding very low temperature shall be used. The secondary packaging shall also be capable of withstanding very low temperatures, and in most cases will need to be fitted over the primary receptacle individually. Provisions for the consignment of liquid nitrogen shall also be fulfilled. The primary receptacle and the secondary packaging shall maintain their integrity at the temperature of the liquid nitrogen.</p>		
3. Whatever the intended temperature of the consignment, the primary receptacle or the secondary packaging shall be capable of withstanding without leakage an internal pressure producing a pressure differential of not less than 95 kPa and temperatures in the range -40 °C to +55 °C.		
4. Alternative packagings for the carriage of animal material may be authorised by the authority of the country of origin ^a in accordance with the provisions of 4.1.8.7.		

^a If the country of origin is not a Contracting Party to ADR, the competent authority of the first Contracting Party to the ADR reached by the consignment.

P621	PACKING INSTRUCTION	P621
This instruction applies to UN No. 3291.		
The following packagings are authorized provided the general provisions of 4.1.1 and 4.1.3 are met:		
<p>(1) Rigid, leakproof packagings meeting the requirements of Chapter 6.1 for solids, at the packing group II performance level, provided there is sufficient absorbent material to absorb the entire amount of liquid present and the packaging is capable of retaining liquids;</p> <p>(2) For packages containing larger quantities of liquid, rigid packagings meeting the requirements of Chapter 6.1 at the packing group II performance level for liquids.</p>		
Additional requirement:		
Packagings intended to contain sharp objects such as broken glass and needles shall be resistant to puncture and retain liquids under the performance test conditions in Chapter 6.1.		

IBC620	PACKING INSTRUCTION	IBC620
This instruction applies to UN No. 3291.		
The following IBCs are authorized, provided the general provisions of 4.1.1 , 4.1.2 and 4.1.3 are met:		
Rigid, leakproof IBCs conforming to the packing group II performance level.		
Additional requirements:		
<ol style="list-style-type: none"> 1. There shall be sufficient absorbent material to absorb the entire amount of liquid present in the IBC. 2. IBCs shall be capable of retaining liquids. 3. IBCs intended to contain sharp objects such as broken glass and needles shall be resistant to puncture. 		

LP621	PACKING INSTRUCTION	LP621
This instruction applies to UN No. 3291.		
The following large packagings are authorized, provided the general provisions of 4.1.1 and 4.1.3 are met:		
<p>(1) For clinical waste placed in inner packagings: Rigid, leakproof large packagings conforming to the requirements of Chapter 6.6 for solids, at the packing group II performance level, provided there is sufficient absorbent material to absorb the entire amount of liquid present and the large packaging is capable of retaining liquids;</p> <p>(2) For packages containing larger quantities of liquid: Large rigid packagings conforming to the requirements of Chapter 6.6, at the packing group II performance level, for liquids.</p>		
Additional requirement:		
Large packagings intended to contain sharp objects such as broken glass and needles shall be resistant to puncture and retain liquids under the performance test conditions in Chapter 6.6.		

Mixed Packing Provisions:

MP5: UN No. 2814 and UN No. 2900 may be packed together in a combination packaging in conformity with P620. They shall not be packed together with other goods; this does not apply to UN No. 3373 diagnostic specimens packed in accordance with P650 or to substances added as coolants, e.g. ice, dry ice or deeply refrigerated liquid nitrogen.

MP6: Shall not be packed together with other goods. This does not apply to substances added as coolants, e.g. ice, dry ice or deeply refrigerated liquid nitrogen.

Appendix 4 - Examples of Completed Consignment Documentation

For transport by road, within Ireland, the information provided in the C1 Form¹⁰ required under the Waste Management (Movement of Hazardous waste) Regulations, 1998 should be sufficient to satisfy the obligation of the consignor to provide a transport document under the Carriage of Dangerous Goods by Road Regulations provided, all the information required in the latter Regulations is included and is stated in the format stipulated. Where the waste is being shipped abroad, separate documentation is necessary.

Two examples of C1 Forms completed in a manner which should satisfy both sets of regulations are given below. The first example relates to healthcare risk waste where a specific pathogen has not been identified. The second example relates to waste where the healthcare risk waste has been assessed as containing a specific pathogen. i.e. in the example: Yellow Fever virus. The entries in the numbered paragraphs which must be completed to satisfy ADR are paragraphs 1, 2, 6, 7 & 11. The information in entry No. 2 must include:

- (a) UN number preceded by the letters “UN”,
- (b) Proper shipping Name
- (c) Class Number
- (d) Packing Group (if applicable)

The information must be given in this order. The examples relate to healthcare risk waste as follows:

- 1) UN 3291, Clinical Waste, Unspecified, N.O.S. 6.2, II,*
- 2) WASTE, UN2814, Infectious substance,
affecting humans, (Yellow Fever virus), 6.2 (E)**

*N.O.S. = “not otherwise specified”, 6.2 = Class, II = Packing Group.

** (E) = tunnel restriction code

(Note: UN2814 material is banned from transport in tunnels)

The information given in entry no. 7 must include the number and type of packages and total quantity of dangerous goods.

The relevant EWC code for entry No. 3 can be obtained from the European Waste catalogue as published by the EPA, an extract of which is given below. Entries marked with an asterisk are regarded as hazardous.

In addition to consignee information – the name and telephone number of a responsible person must be included.

¹⁰ N.B. – see boxed note in Section 5.1.3 on introduction of new Waste Transfer Form replacing the C1 Form.

18 WASTES FROM HUMAN OR ANIMAL HEALTH CARE AND/OR RELATED RESEARCH (except kitchen and restaurant wastes not arising from immediate health care)

18 01 wastes from natal care, diagnosis, treatment or prevention of disease in humans

18 01 01 sharps (except 18 01 03)

18 01 02 body parts and organs including blood bags and blood preserves (except 18 01 03)

18 01 03* wastes whose collection and disposal is subject to special requirements in order to prevent infection

18 01 04 wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers)

18 01 06* chemicals consisting of or containing dangerous substances

18 01 07 chemicals other than those mentioned in 18 01 06

18 01 08* cytotoxic and cytostatic medicines

18 01 09 medicines other than those mentioned in 18 01 08

18 01 10* amalgam waste from dental care

18 02 wastes from research, diagnosis, treatment or prevention of disease involving animals

18 02 01 sharps except (18 02 02)

18 02 02* wastes whose collection and disposal is subject to special requirements in order to prevent infection

18 02 03 wastes whose collection and disposal is not subject to special requirements in order to prevent infection

18 02 05* chemicals consisting of or containing dangerous substances

18 02 06 chemicals other than those mentioned in 18 02 05

18 02 07* cytotoxic and cytostatic medicines

18 02 08 medicines other than those mentioned in 18 02 07

WASTE MANAGEMENT (MOVEMENT of HAZARDOUS WASTE) REGULATIONS 1998

Form C.I. Consignment Note for consignments of hazardous waste transported within the State
(NOT to be used for transhipment into or out of the State)

PART A (to be completed by the consignor) B (serial no.) -----

1. Name and address of consignor¹: **Another Hospital, Sandy Lane, Cross Roads, Dundrum, Dublin 16**
.....Tel: **01 - 987 6543**Fax: **01 - 9876544**.....
2. Name and chemical composition of waste* **UN3291 Clinical Waste, Unspecified, N.O.S. 6.2, II**.....
3. European Waste Catalogue/Hazardous Waste list Description(s) and Code(s)²: **Wastes whose collection and disposal is subject to special requirements in order to prevent infection - 18 01 03**
4. Origin of waste (name and address of producer, if different from 1.)
5. Process(es) that waste originates from:..... **Healthcare treatment for Humans**.....
6. Quantity (indicate kg or litres):..... **511 kg**
7. Size, type³ and number of containers: ... **10 x 770 litre wheeled bins**.....
8. Physical characteristics⁴:..... **solids and liquids**.....
9. Components which are hazardous (giving concentrations in each case): ... **Possible infection risk - cannot be quantified**...
10. Hazardous properties⁵ and special handling instruction (if any): **May contain sharps and be infectious; wear gloves and overalls.**
11. Name and address of consignee⁶:... **Healthcare Waste Treatment Ltd., Unit 1, Industrial Estate, Dublin 12.**
Responsible person - Mr XXXX XXXX, Contact Tel No. 01-1234567
12. I, the consignor, certify that the information given in Part A above is complete and correct to the best of my knowledge.
Signed **Hospital Person**.....Date..... **1/1/2010**.....
Name (block letters) ... **HOSPITAL PERSON**.....on behalf of **Another Hospital**
- Position held by person signing..... **Hospital Person Position**.....

PART B (to be completed by the carrier)

13. I, the carrier,⁷ certify that I collected the waste described in Part A in vehicle (reg. no.) at (time)on (date)
and that I have been informed of the hazardous nature of the waste, as set out in that Part.
Signed..... **Driver**.....on behalf of ... **Healthcare Waste Treatment Plant plc**
Name (block letters)Signature of consignor as witness **Hospital Person**.....

PART C (to be completed by the consignee)

14. Name and address of consignee:.....Tel:Fax:.....
15. Waste licence number (if applicable)⁸.....Waste permit number (if applicable)⁹..... Certificate of registration (if applicable)¹⁰.....
16. The waste described in Part A was delivered to me by (carrier) in vehicle (reg. No.)
at (time) on (date) On behalf of (consignor)
17. (a) The consignment was accepted:..... (b) The consignment was rejected
18. If the consignment was rejected, state the reason(s).....
19. If the consignment of waste was accepted, state the recovery/disposal activity(ies) to which it will be subject and provide code number and description of the technology involved¹¹
.....
20. I, the consignee, certify that the information given in Part C above is complete and correct to the best of my knowledge.
SignedDate.....
Name (block letters)on behalf of
- Position held by person signing.....

* full description may be attached on separate page

Footnotes ¹ to ¹¹ see relevant definitions and lists in the "Instructions for completion of Consignment notes for Hazardous Waste".

CARRIER'S COPY - to be given to the carrier of the waste, after completion of PART C by the consignee, and retained by the carrier.