Disposal of Biological/Clinical Laboratory Waste

Policy and Procedures

UNIVERSITY OF CAMBRIDGE

Health and Safety Division
March 2004

Contents

Review: no later than March 2006

1. Introduction

1.1 This University Code of Practice describes the procedures to be used for the disposal of biological/clinical waste via a specialist clinical waste disposal contractor. It has been produced to ensure that all aspects of waste segregation, packaging, labelling, accumulation and preparation for transport and transfer are in accordance with legislative requirements. It also takes account of the arrangements agreed with the contractor who will collect the waste from the University and dispose of the waste by incineration.

1.2 All biological/clinical waste produced by the University of Cambridge for disposal via the specialist contractor MUST be segregated, packaged and labelled in accordance with the procedures given in this document.

1.3 The advice given in this document does not apply to departments on hospital sites using the local National Health Service (NHS) biological/clinical waste disposal systems. **HOWEVER, departments using NHS systems must assure themselves that their local management of waste within their buildings and areas is being run in accordance with all legislative requirements and local rules. This code has relevant information on how to achieve this.**

1.4 For the disposal of first aid waste, departments that do not have a system of clinical waste disposal in place should refer to the advice given in their first aider training.

1.5 Kitchen/food waste may contain animal bones etc and should be disposed of as determined by the local policy.

2. General

2.1 Legislation requires that different types of waste are disposed of by different methods depending on the nature of the waste materials. Hence biological/clinical waste MUST be properly segregated prior to disposal.

2.2 The criteria set down in this document for segregating the University's biological/clinical waste should ensure that:

i) all waste that should be disposed of as biological/clinical waste is disposed of as such;
ii) other materials that need to be disposed of in a different way are not disposed of as biological/clinical waste; and
iii) an expensive disposal route is not used for materials that are permitted in the general waste stream.

2.3 When transported on the public highway biological/clinical waste is classified as dangerous goods and as such must be packaged and labelled for transport in accordance with various legislative requirements. This document describes how the University's biological/clinical waste must be labelled.

2.4 If using a contractor to transport non-inactivated Class 1 or above genetically modified (GM) waste on a public highway to an incinerator, the company must be registered with the Health and Safety Executive (HSE) for undertaking work with genetically modified organisms.

2.5 Derogation is required from the HSE for any GM project where GM waste is being transported to an incinerator on a separate site PRIOR to being inactivated (e.g. autoclaved).

2.6 In the event of any doubt arising as to what may be disposed of as biological/clinical waste in the University, or any unusual or particularly difficult objects arising for disposal, which cannot be easily packaged as described, the Biological Sciences Safety Officer, Dr Martin Vinnell (65272), or the Health and Safety Division (HSD) (39535) should be contacted for advice.

3. Responsibilities

3.1 Heads of departments are ultimately responsible for the management of biological/clinical waste generated in their departments until it is consigned to the contractor. Thereafter heads of departments continue to have residual responsibilities under the Duty of Care.

3.2 The Head of Department (HOD) may delegate working responsibility for compliance with this code to the Departmental Safety Officer (DSO), Departmental Biological Safety Officer (BSO), or other suitable nominated person(s).

3.3 The research supervisor is responsible for day-to-day supervision of operating procedures relating to biological/clinical waste arising in a specific laboratory and compliance with this code.

3.4 Specific separate arrangements may be in place for specialised areas such as animal accommodation/facilities.

3.5 Individual workers are responsible for compliance with all aspects of legislation relevant to work that they undertake. The individual is responsible for segregating waste arising, and packaging and labelling waste in compliance with this code. The individual worker is also required to bring to the attention of the Departmental Safety Officer or other nominated person(s) any non-conformance, by design or mistake, in relation to this code.

3.6 The Departmental Safety Officer or other nominated person(s) is responsible for undertaking routine monitoring and audit (at least annually) of waste generation, segregation, packaging, labelling and accumulation.

4. Segregation

4.1 General Principles

4.1.1 Within the laboratory, waste management systems must operate to ensure that all the types of waste produced are segregated, treated, transported and destroyed in accordance with legal requirements. This system of segregation may be based, for example, upon colour coding of bins, and clear instructions for users, to ensure mistakes in the use of a particular waste route are avoided. See Appendix 1 for an example sign to display at disposal points.

4.1.2 A decision to adopt a disposal route not indicated below must be justified by risk assessment and approved by a School Safety Officer or the HSD. Transport of GM or infectious waste to an off site incinerator via a public highway PRIOR to inactivation (e.g. autoclaving) maybe used as an emergency measure (where appropriate), and the appropriate approved packaging for transport of infectious waste used. On-site inactivation of GM or infectious waste prior to transport must always be used in preference to this.

4.2 Biological/Clinical Waste

4.2.1 The following waste materials are designated as biological/clinical waste for disposal by incineration irrespective of whether they pose an infection risk:

i) all animal carcasses;
ii) all sharps (e.g. scalpel blades, needles etc);
iii) all syringe bodies;
iv) all bones and organs (whole or in part) and any other tissues from animals or humans;
v) contaminated waste or cultures from laboratories working with micro-organisms (including genetically modified micro-organisms) which has not been inactivated by another validated means; and

vi) contaminated animal bedding, such as that from animals deliberately infected with pathogenic micro-organisms, animals in quarantine, where the veterinarian has identified a hazard associated with drug administration, and where the veterinarian has identified any other hazards e.g. in the case of animal illness (infection).

4.2.2 No items are to be disposed of as biological/clinical waste unless these are specifically included within this code.

4.3 Other 'Hazardous' Waste

4.3.1 The following materials must be disposed of using alternative, approved disposal routes and MUST NOT be disposed of as biological/clinical waste:

i) chemicals;
ii) radioactive materials;
iii) pharmaceuticals;
iv) confidential paperwork.

4.3.2 Where any waste materials listed in section 4.3.1 also pose an infection risk (i.e. is contaminated with micro-organisms) the Biological Sciences Safety Officer or Health and Safety Division should be contacted for advice on the appropriate disposal route to be used.

4.4 Non-biological/clinical, Non-hazardous Waste

4.4.1 The following waste materials SHOULD NOT be disposed of as biological/clinical waste:

i) general office waste;
ii) cardboard boxes;
iii) packaging materials (e.g. bubble wrap, polystyrene chippings etc);
iv) general waste (e.g. paper hand towels, paper tissues, scrap paper, boxes, tins, packaging etc);
v) laboratory waste previously contaminated with micro-organisms (including genetically modified micro-organisms) that has been rendered safe by either disinfection or autoclaving by a VALIDATED METHOD **(with the exception of any items in sections 4.2.1 (i) and (iv) above);** and
vi) animal bedding other than that described in section 4.2.1 (vi) above.

4.5 Summary of disposal routes

4.5.1 The table below summarises the preferred way of disposing of the various types of waste that are produced in a laboratory.

Waste type	On-site inactivation required?	Special approved packaging required for transport?	Final disposal method
Cardboard, packaging, paper hand towels etc., non contaminated, non infectious animal bedding	No	No	Landfill
General laboratory waste including GM and non GM infectious agents and transgenic plant seeds and material	Yes	No	Landfill
Non infectious carcasses (including GM), sharps, syringe bodies, bones, organs, contaminated animal bedding	No	Yes	Incineration
Known infectious carcasses, bones, organs, contaminated animal bedding	Yes	Yes	Incineration

5. Types of Packaging

5.1 Only the following types of packaging, specifically approved by the waste contractor, can be used for biological/clinical waste. These are:

i) yellow, 300 gauge (recommend 500 gauge or above), plastic sacks, where these are subsequently placed into a rigid container for transport on the public highway by the contractor
ii) yellow, sealable, rigid plastic bins (UN Approved and to relevant British Standard); and
iii) yellow, plastic, sharps containers (UN Approved and to relevant British Standard).

5.2 The appropriate type of packaging MUST be used for different waste materials. This is as described in Section 6 below.

5.3 Departments must purchase suitable containers themselves.

5.4 Sharps containers MUST conform to the relevant British Standard (BS 7320: Specification for Sharps Containers, 1990). The British Standard specifies that sharps containers must be puncture resistant and leak-proof, have a handle that is not part of the closure device, have an aperture that will inhibit the removal of the contents but will ensure that it is possible to place used sharps in the container with one hand without contaminating the outside, have a closure device attached, have a horizontal line to indicate when the container is three-quarter full marked with the words 'Warning - do not fill above the line', be yellow and clearly marked with 'Danger', 'Contaminated Sharps Only', 'Destroy by Incineration' or 'To Be Incinerated'. Plastic sharps containers MUST be used as these do not disintegrate when wet sharps are put in the container. Cardboard containers are not acceptable.

6. Choice of Packaging

6.1 Appropriate packaging must be used to ensure the biological/clinical waste does not present a hazard to any person during normal handling between the laboratory and the incinerator. It is important that laboratories adopt a system whereby pipettes/pipette tips and other 'sharp' items (not specifically designated as sharps waste) CANNOT pierce bags. This would usually involve the use of a primary container which is then placed into the bag when full. The different types of biological/clinical waste (described in more detail above in Section 4 'Segregation') must be packaged as follows:

6.2 Sharps must be placed in a sharps container for disposal. Unprotected sharps must NEVER be placed in any type of waste bag. Particular care should be taken to ensure that sharps containers are properly put together when taken into use as otherwise they may come apart when sent for disposal. Full sharps bins MUST NOT be placed in yellow sacks for disposal.

6.3 Syringe bodies must never be disposed of into the domestic waste stream, even if they are not contaminated, due to the perception of such un-rendered items in landfill. Syringe bodies can be placed in yellow sacks or sharps containers for disposal. If used with a needle then it is preferable for both the needle and syringe body be placed in the sharps container without disconnecting the two. Syringe bodies with needles attached MUST NOT be placed in yellow sacks. This includes needles that for specific reasons have been re-sheathed.

6.4 **Infectious laboratory waste** – That is general laboratory waste that is contaminated with micro-organisms and not containing any of the items covered in other parts of this section should be placed in biological/clinical waste containers for disposal. Items must be carefully placed in yellow sacks to ensure the plastic is not punctured or damaged. Particular care should be taken when disposing of pipettes and pipette tips as these may puncture the bag. Sharps and glass items MUST NOT be placed in yellow sacks under any circumstances. Yellow sacks must not be overfilled. The top of the sack must be closed with a bag tag when the sack is a maximum of two thirds full.

6.5 **Bones, organs and any other human or animal tissues** – In general bones, organs and any other tissues from either humans or animals must be double wrapped in two yellow sacks for disposal unless they fall into any of the groups listed below in which case they must be sealed in a yellow bin for disposal:

i) material with liquid associated with it which may leak from the bags;
ii) material with sharp edges which may puncture the bags;
iii) material that is recognisable and of a sensitive nature;
iv) material that comes from an animal or person known to be infected with a pathogenic micro-organism.

6.6 **Animal bedding** – Animal bedding should be placed in a yellow sack for disposal. Due to the weight of animal bedding and in order to prevent manual handling problems, yellow sacks must not be overfilled.

6.7 **Animal carcasses** – Carcasses of rodents and other small mammals such as rabbits and guinea pigs must be double wrapped in two yellow sacks for disposal unless the animals were deliberately infected with micro-organisms in which case the carcasses must be sealed in a yellow bin for disposal. Carcasses of primates and other large mammals must be sealed in a yellow bin for disposal. Carcasses that have been autoclaved must be sealed in a yellow bin for disposal.

7. Labelling

7.1 Waste must be packaged and labelled at the point of generation.

7.2 Packages containing biological/clinical waste for disposal must be labelled as: Clinical Waste, Unspecified, NOS UN 3291 and show the biohazard sign.

7.3 In addition to the labelling described above it must be possible to trace the source of each package. For example, ‘bag tags’ can be used to close the tops of yellow sacks or put on the handles of yellow bins and sharps containers. Information MUST include the collection point used and the particular room or area where the waste was generated. Departments need to devise a simple code for identifying the source of the waste (taking security aspects into consideration).

8. Storage and Disposal

8.1 Waste must be packaged and labelled at the point of generation.

8.2 With the exception of animal carcasses, biological/clinical waste should be taken to a designated secure collection point for removal by the contractor as soon as possible after generation.

8.3 Animal carcasses must be kept in cold storage and only be taken to a designated collection point a short time (less than 2 hours) before the contractor is due to make a collection. If notified of a delay by the contractor, the department must return carcasses to cold storage until the contractor is able to complete the collection. Animal carcasses MUST NOT, under any circumstances, be left at a collection point overnight.

8.4 Biological/clinical Waste MUST NOT be left for collection anywhere other than at a designated collection point. Waste must be stored at the collection points in such a way that it is secure from interference from unauthorised persons and is animal proof (particularly regards foxes, domestic animals, birds and rodents). Where containers are stored in open areas on-site, they must always be locked to prevent authorised access.

8.5 The location of the collection points must be as agreed by the Health and Safety Division and Biological Sciences Safety Officer, taking into account security, access and any other relevant requirements arising out of detailed site inspections.

8.6 The contractor must be supplied with the necessary keys, swipe cards, authorisations etc to gain access to secure areas where waste is stored. If waste is not stored within a secure area then it must be kept in a locked container and the contractor must be provided with a key to the container.

8.7 Departments are responsible for monitoring, cleaning, disinfection and maintenance of collection points.

8.8 The contractor will only collect biological/clinical waste that has been properly packaged and labelled. In the event of waste materials not conforming with these requirements, the contractor's driver will leave the waste at the collection point.

9. Non-Conformances and Corrective Actions

9.1 Non-conformances may be identified at any point in the chain of waste generation, segregation, packaging, labelling, accumulation, collection, transport and incineration by any persons involved in the chain.

9.2 Internal (University) or external auditing of the management and control of clinical waste may also detect non-conformances.

9.3 All non-conformances identified from the point of generation of the waste in the University departments to the point of its accumulation at designated collection points must be reported to the Departmental Safety Officer or other nominated person(s).

9.4 If non-conforming clinical waste arises on the premises of the University of Cambridge, it will be quarantined under local storage arrangements and will remain in the area concerned awaiting attention by the persons responsible for generating the waste. Such waste must not be mixed with acceptable waste and its unauthorised consignment must be prevented.

9.5 Non-conformances identified from the point of removal of the waste from the designated collection points to the point of its disposal at a licensed clinical waste incinerator will be reported to the Health and Safety Division. The Biological Sciences Safety Officer can advise departments if any corrective action is required and support the appropriate Departmental Safety Officer or other nominated person(s) and individual workers in implementing the corrective actions within an agreed timescale.

9.6 The Health and Safety Division will regularly audit for non-conformances and corrective action and check the effectiveness of the above procedure.

10. Macerators

10.1 The carcasses of some small mammals may be disposed of by maceration. However, the preferred route for disposal of all animal carcasses is by incineration except in the case of those involving work with radioactive isotopes. Advice on disposal of radioactive carcasses can be obtained from the University Radiation Protection Officer.

10.2 Carcasses of animals deliberately inoculated with pathogens MUST be incinerated, maceration may not be used unless the carcass has first been made safe by autoclaving. However, this latter route is not recommended.

11. Other Incinerators and Methods

11.1 All carcasses and biological/clinical waste for final disposal by incineration should be disposed of via an approved specialist contractor, as agreed with the Health and Safety Division.

11.2 There are various types of mini incinerators/clinical waste treatment devices available that are marketed as being suitable for the disposal of clinical waste or animal carcasses. Whilst these need not be licensed under environmental legislation, departments should be aware there are some practical problems associated with use of these units. These include such things as the production of hazardous emissions to atmosphere, liquid trade effluent entering the drains and disposal of ashes and residues. Departments MUST NOT proceed with purchase of such equipment without first consulting the Biological Sciences Safety Officer or the Health and Safety Division.

Appendix 1 Example Sign for Disposal Points

UNIVERSITY OF CAMBRIDGE

EXAMPLE

Waste Disposal

Non-hazardous (Black Bag):

Cardboard, packaging, paper hand towels etc. → Departmental Instruction

General Laboratory Waste:

General Laboratory waste that is or may be biologically contaminated (with GMMs or non-GMMs) → Departmental Instruction

Containment Laboratory Waste:

or

(state specific arrangements) → Departmental Instruction

Biological Waste (Yellow Bags/Bins):

Non infectious carcasses, Bones, blood and organs, bio-contaminated (non GM) waste or cultures from labs, contaminated animal bedding → Departmental Instruction

Sharps Bins (Yellow/Blue):

Syringe needles (including barrels), blades, scalpels → Departmental Instruction

Waste Chemicals:

Solid and liquid hazardous waste chemicals (in primary containters). → Departmental Instruction

Glass and Aerosols:

Uncontaminated glass (broken and unbroken), rinsed bottles (less than 2.5 litre), spray cans, empty camping gas bottles. → Departmental Instruction

Waste to Drains:

Some diluted chemical, authorised radioactivity.

ASK SAFETY OFFICER FOR ADVICE → Departmental Instruction

Empty Glass Bottles:

Rinse out empty bottles. Those smaller than 2.5 litre can go into Orange Bins. Winchesters (2.5 litre) can be returned to company or recycled. → Departmental Instruction

Radioactive Material:

Registered radioisotope users only. Follow Local Rules. If in doubt, see the SRPS or RPS. → Departmental Instruction

If in any doubt as to where to put waste, ask the relevant Safety Officer

Acknowledgments

This document has been produced via the Sub-committee for Biological Hazards following extensive consultation.

Particular effort in bringing this document to publication was expended by the Secretary and Biological Sciences Safety Officer with helpful input from the Safety Officer at the Clinical School and Dr Tiley.

UNIVERSITY OF CAMBRIDGE

20 Trumpington Street
Cambridge CB2 1QA

Tel: 01223 333301
Fax: 01223 330256
safety@hermes.cam.ac.uk
www.admin.cam.ac.uk/offices/safety

HSD027B