UNIVERSITY OF BIRMINGHAM

GUIDANCE NOTE 7: PROCEDURE FOR DISPOSAL OF CLINICAL WASTE

University Policy requires that:

All biological materials are disposed of safely and in accordance with University procedures;

Introduction

This protocol is intended to ensure compliance with environmental and health and safety legislation, to satisfy the needs of the contractor and act as a minimum standard for application across the University. Schools and departments are free to use more stringent controls if they so wish. Because it is a University-wide procedure it may need to be adapted to local circumstances to take into account specific types of waste or existing practices. It is not intended to be rigid and proscriptive. If in doubt please contact the Health and Safety Unit.

What is Clinical Waste?

There are two sets of regulations covering the management of hazardous waste:

The Hazardous Waste Regulations

- Define hazardous waste in England and Wales
- Require producers or consignors of hazardous waste to register their premises
- Restrict mixing and require separation of hazardous waste where appropriate
- Make sure that companies document the movement of hazardous waste
- Require consignees receiving hazardous waste to keep thorough records

The List of Wastes Regulations

- Introduce the “List of Wastes”, known as the European Waste catalogue, which categorises wastes based on a combination of what they are and the process or activity that produced them
- Explain the list, giving guidance on selecting a correct six digit code for the waste
- Show how waste is classified as either hazardous or non-hazardous
- Show limits for certain hazardous properties

'Hazardous Waste' is waste that is listed in the *List of Waste Regulations* because it displays one or more properties that are hazardous to health, safety or the environment.

Clinical wastes, from laboratories and healthcare premises, may be hazardous if they are infectious. Further guidance on this may be found in *The safe management and disposal of healthcare waste*. The Environment Agency's technical guidance document WM2, *Interpretation of the definition and classification of hazardous waste*, also provides information on waste classification. This can be found on the Environment Agency website.

“Clinical” waste produced by the University will fall into the **H9 "infectious"** hazard property: substances containing viable micro-organisms, or their toxins, which are known or reliably believed to cause disease in man or other living organisms.

In practice only some of the University’s waste is infectious as pre-treatment is required before disposal. However, the University adopts a “belt and braces” approach and currently sends all its clinical waste for incineration, for reasons outlined below.

Other items for disposal as clinical waste

Whilst the prime concern is for agents that are infectious, there may be other agents (e.g. plant and animal pathogens requiring a DEFRA licence) that present an ***environmental risk*** and where clinical waste is the most appropriate route for disposal.

Equally ***sharp items*** that may not be contaminated still present a significant risk of physical injury to those handling waste. In many cases it will be sensible to dispose of them safely by placing them in "Sharps boxes".

Clinical waste will include limbs, organs and recognisable human tissue, animal carcasses, microbiological, tissue culture and GM waste (these should be treated, preferably by autoclaving, before disposal) and "sharps" (which include **contaminated*** broken glass and any other **contaminated*** disposable sharp instrument or item, **including contaminated plastic pipette tips**).

***** *In the context of this procedure "contaminated" means contaminated with potentially infectious agents*

Note: Cytotoxic or Cytostatic medicines are defined as any medicinal product which has one or more of the following hazardous properties: toxic, carcinogenic, mutagenic and toxic for reproduction. Examples from human healthcare include antineoplastic agents, many hormonal drugs, some antivirals, immunosuppressants, and others. A separate waste stream is required for Cytotoxic/Cytostatic substances.

Disposal of Clinical Waste

Waste taken away by the University's clinical waste disposal contractor may ultimately be treated and disposed of in one of three ways:

1. By incineration
2. By treatment at an "Alternative Technology" plant. This involves shredding the waste and then subjecting it to dry heat, steam or chemical treatment, followed by landfill.
3. By landfill

Given the mixed nature of waste produced by the University, the difficulty in ensuring correct segregation of this waste at the laboratory level, and the likelihood of chemical contamination of at least some of the laboratory waste, current practice is that **ALL** clinical waste is incinerated. All yellow bags and sharps boxes should be placed in yellow 770 litre bins. **When full and ready for collection bins should be labelled with the yellow, pre-printed, indestructible labels supplied by the University clinical waste manager in Hospitality and Accommodation Services (HAS).** This will ensure they are taken away and ultimately disposed of by incineration.

Pre-Treatment of Waste Before Disposal

Most types of clinical waste need pre-treatment before final disposal. This applies particularly to microbiological cultures, tissue culture, GM waste, any material known to be infectious and waste associated with infected animals, in which cases the waste should be autoclaved before it is incinerated.

Small items of contaminated broken glass may be placed in sharps containers. Glass that cannot easily be placed into a sharps box should be treated to make it safe, ideally by autoclaving, before disposal down the usual broken glass route.

SEE TABLE at end of this section for types of waste, sources and appropriate disposal routes.

Procedures for Dealing with Clinical Waste

Schools and Departments must identify areas producing clinical waste and provide clearly identified containers (sharps boxes, disposafe jars, yellow sacks or autoclave bags). Waste should be labelled with the department name, and where appropriate, a lab number. A local decision must be made whether to designate rooms or laboratories as clinical waste areas so that all waste goes in the clinical waste stream (mandatory for Category 3 containment facilities, for example) or whether to segregate between non-harmful (black bag waste) and clinical. Where segregation is allowed particular attention must be given to ensuring that no clinical waste is placed in the wrong bag, e.g. by separation, notices and training and information.

Anatomical clinical waste, such as Carcasses and recognisable human tissue, should be placed in a yellow-lidded solid container. Carcasses and human tissue should be kept appropriately e.g. frozen, chilled or fixed until taken to the clinical waste bin. Producers should delay putting containers containing this waste into the waste bins until as close as practical to the collection time to avoid decomposition etc.

Clinical waste must be placed in appropriate containers at the point of production. Laboratories and other facilities should have sharps containers so that contaminated sharps can be placed in containers immediately after use. Sharps containers should be of yellow plastic and comply with BS 7320:1990.

Each room producing clinical waste should have a bin or bag holder provided, with a yellow clinical waste sack or autoclave bag. Bags should be to the current standard.

On no account must clinical waste be put into any container other than a sharps box, lidded container, disposafe jar, yellow sack or autoclave bag.

> *NOTE: pressurised containers such as aerosol canisters must not be placed in clinical waste containers.*

Yellow clinical waste sacks, autoclave bags, disposafe jars and sharps boxes should never be overfilled and must be sealed and labelled before removal. Clinical waste sacks should be sealed either daily or when three-quarters full. Overfilling of the sack may make it difficult to seal and carry. Sacks should be sealed with the ties provided and the name of the department or School written on the tab, or on a label, then affixed to the waste container.

Sharps boxes should be sealed, using the lid provided **before** it becomes unsafe to put more sharps in. Staff should be instructed not to press down sharps in the container to make more room and on no account to attempt to remove sharps from the box. **Sharps boxes should not be placed in yellow sacks and should have the name of the University and School/Department marked on them.**

Where waste is to be autoclaved the usual procedures should be followed and the autoclaved waste that is destined for incineration (e.g. disposable culture dishes) placed in yellow sacks as above.

Sealed and Labelled containers should be taken to the collection bins by nominated staff. Whoever carries the waste must be aware of the special concerns relating to the waste, the procedures for noting the amount of containers and for dealing with a spillage. Staff carrying waste containers should wear overalls or laboratory coats and gloves. They should:

- Check that the containers are effectively sealed and are labelled with lab number and department
- Carefully check the weight of each container before lifting to avoid injury and not attempt to carry large numbers of bags at once.
- Handle the bags by the neck only and avoid throwing or dropping them where possible.

If a trolley or cart is needed to move large numbers of bags this should ideally be dedicated to use for clinical waste and be made of material that can readily be disinfected in the event of a spillage.

Types of clinical waste loaded into the collection bins must be recorded on the University's Clinical Waste Disposal form when the bins are ready for collection. It is essential that copies of the completed forms are kept by the department. For each clinical waste collection point the nominated "keyholder" should possess a book of forms obtainable from the Clinical Waste Manager within Hospitality and Accommodation Services (HAS). One form should be completed for every collection. The department should keep one copy of the completed form and the remaining copy/copies should be placed in a protective plastic sleeve and securely attached with cable ties or string to one of the yellow-label tagged wheelie bins. The driver will remove these and take them to the Clinical Waste Manager who will then fill out the statutory Consignment Note on behalf of the University. The waste will be given the appropriate six digit code from the European Waste Catalogue, in the case of clinical waste from the University, this is usually 18 01 03 – *wastes whose collection and disposal is subject to special requirements in order to prevent infection*, although there are other categories, e.g. anatomical waste, and occasionally medicinal or cytotoxic/cytostatic waste streams for specialised areas. Further information can be obtained from the Health and Safety Unit.

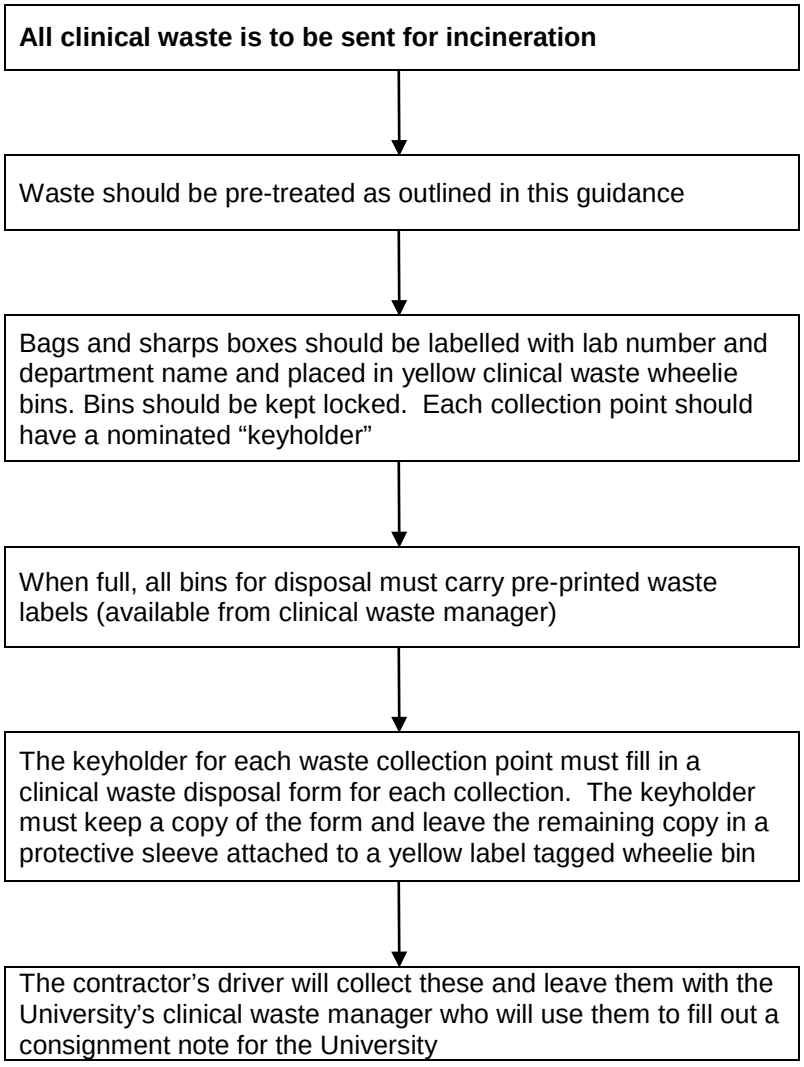
Accident, Incident and spillage procedures should be developed by the School or Department and made known to all persons handling and transporting clinical waste. Any accident, untoward incident or spillage must be reported to the Clinical Waste Manager as soon as possible. In the event of an injury from a sharp the Occupational Health Unit in should be contacted as soon as possible.

Spillages should be contained, liquids absorbed and the waste repackaged. Particular caution is needed in this procedure, particularly with wet waste or sharps spillage. In the first instance the area should be cleared. Further precautions will be necessary, e.g. the provision of gloves and eye protection. If possible the producers should be contacted and asked to assist. Disinfection of contaminated areas should be carried out using appropriate disinfectants.

Once the incident has been dealt with a report of the incident and the actions taken should be sent to the Health and Safety Unit in the usual way and copied to the Clinical Waste Manager. The local "keyholder" must ensure that bins are locked at all times. Broken bins/locks should be reported immediately to the Clinical Waste Manager.

All staff and, where relevant, students, visitors or others working in areas where clinical waste is produced should be trained and informed of the risks and procedures to be followed. The level of training and information will vary according to the involvement of individuals. For example producers of waste will need to be informed of the risks to themselves and others, the procedures for segregation and the filling of containers.

Summary of Clinical Waste Procedure



Clinical Waste - Risk Summary

Risks from producing and handling clinical waste can be divided into risks from exposure to harmful agents, physical risks from handling the waste and risks to the environment. Risks are to those generating the waste in the laboratory, those packaging and transporting the waste to the collection bins, employees of the contractors involved in disposal away from the University, and members of the public. **ALL are owed a duty of care** to protect them from potential infection or injury.

Biological risks

The primary concern with clinical waste is that of exposure to infectious agents. With clinical specimens the greatest risk comes from blood-borne viruses (HIV, Hepatitis B, C, D, etc). The most significant risk by far is from inoculation or sharps injury. Used hypodermic needles may also be the target of drug users and particular care must be taken to ensure secure storage.

Tissue may contain other pathogens e.g. lung tissue may contain *Mycobacterium tuberculosis* (TB causing organism) and neural tissue may carry agents for transmissible spongiform encephalopathies, which may not be inactivated by normal fixing in formaldehyde. Routes of infection include inoculation injury, aerosol inhalation and ingestion.

Spillage of a bag's contents could lead to exposure by contact, aerosols or sharps injuries.

Physical risks

Bags of clinical waste can be heavy and awkward to carry. The bags have to be manually handled into large bins and there is a risk of physical injury if not appropriately handled or if bags are carelessly filled. Sharps sticking through bags have caused problems to those carrying them in the past both as an infection risk and risk of cuts.

Environmental risks

Environmental risks in the case of clinical waste are similar to health and safety risks in causing harm to persons but also include causing offence to persons. Risks can arise from spillage from inadequate or overfilled packaging, careless handling or inadequate segregation allowing clinical waste to get into the wrong waste disposal stream.

The incineration process itself generates pollutants to the atmosphere and as toxic ash residues. These risks are beyond the scope of this document and are primarily the responsibility of the disposer. The University as a producer has a duty of care to ensure that the disposal contractor is properly authorised and licensed to dispose of the waste and has the necessary facilities or access to them.

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Clinical Waste: Types, Sources and Disposal Routes:

TYPE	SOURCE OF WASTE	TREATMENT/CONTAINER
Contaminated* Sharps Hypodermics, scalpel blades	All	Yellow sharps box with yellow lid. If sharps are contaminated with GMMs the box should be autoclaved. Disposafe jars must NEVER be used for sharps
Pipette tips	All	Disposafe or "sweetie" jars can be used for pipette tips. These should be autoclaved before disposal in yellow bags
Contaminated broken glass	Small items Large items	Yellow sharps box with yellow lid and autoclave if GMMs are present Treatment to render safe (ideally autoclave)
Carcasses	All	Solid container in double yellow bag and keep chilled or frozen until near to collection
Animal Bedding	Known contamination with infectious agents All other	Autoclave first then yellow bag Black Bag
Animal Carcasses infected with GMMs	All	Autoclave, place in solid container
Cultures of micro-organisms, cell-culture; Items contaminated with same; **Genetically modified Micro-organisms / Material contaminated with GMMs**	All	Autoclave first then yellow bag if solid or sluice if liquid
Limbs and organs - Includes recognisable portions of organs, limbs or tissue	All	Fix unfixed items if possible then double yellow bag and/or outer container chilled or frozen until near to collection

Tissue	All at present (new arrangements under discussion)	Fix or autoclave human tissue or high risk tissue from other species then yellow bag;
Blood and body fluids e.g. csf, aspirates etc.	All	Treat to render safe (autoclave/add disinfectant etc.). Vernagel can be used to solidify blood waste but must NOT be autoclaved. Tubes containing small amounts of residual blood may be double bagged, providing they will not leak.
Faeces and Urine	Known highly infectious risk No known highly infectious risk	Autoclave or fix then to sewer via sluice To sewer via sluice
General laboratory waste (Includes gloves, paper towels etc.)	Microbiology or tissue culture laboratories, GM laboratories working areas Paper from non-work areas (e.g. writing area)	From Containment Level 3 labs, all GM labs or high risk specimen handling areas - to be autoclaved then yellow bag. CL2 labs - yellow bag Black bag (except category 3 laboratories)
General laboratory waste (including gloves etc.)	From laboratories **not** handling biological agents or GMMs	Black bag
Infective or genetically modified plant material (environmental risk)	Laboratories and glasshouses	Autoclave then Yellow bag
Radioactive Clinical Waste	Any source	CONTACT the Health and Safety Unit