UNIVERSITY OF CAMBRIDGE

What's this in the Rubbish?

Biological Safety Officers Event

14th May 2013

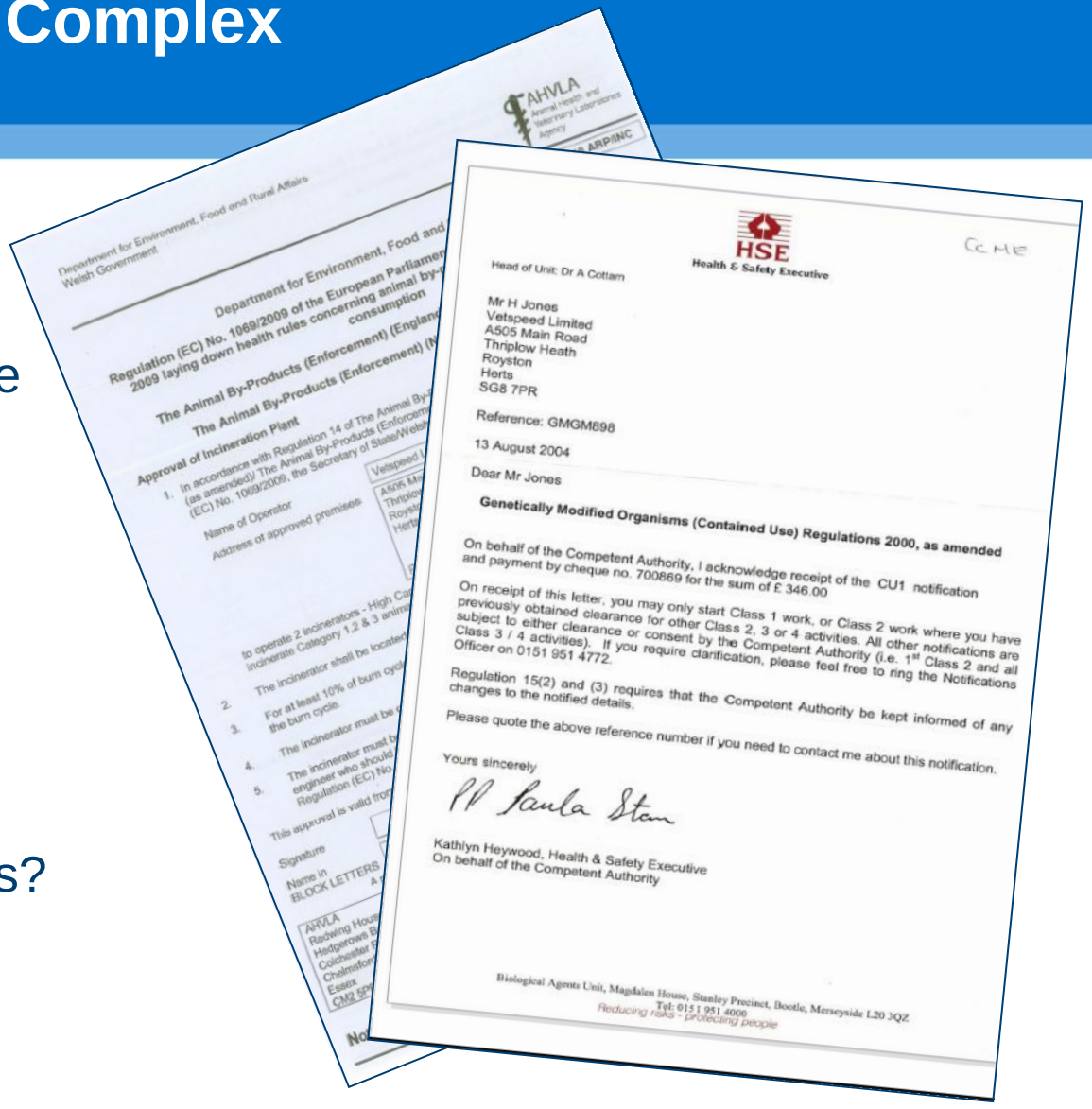
Mark Elsdon – School of the Biological Sciences

Waste Regulation is Complex

Our checks on contractors

Incinerator operators must be appropriately licenced and notified to receive your particular waste – e.g.

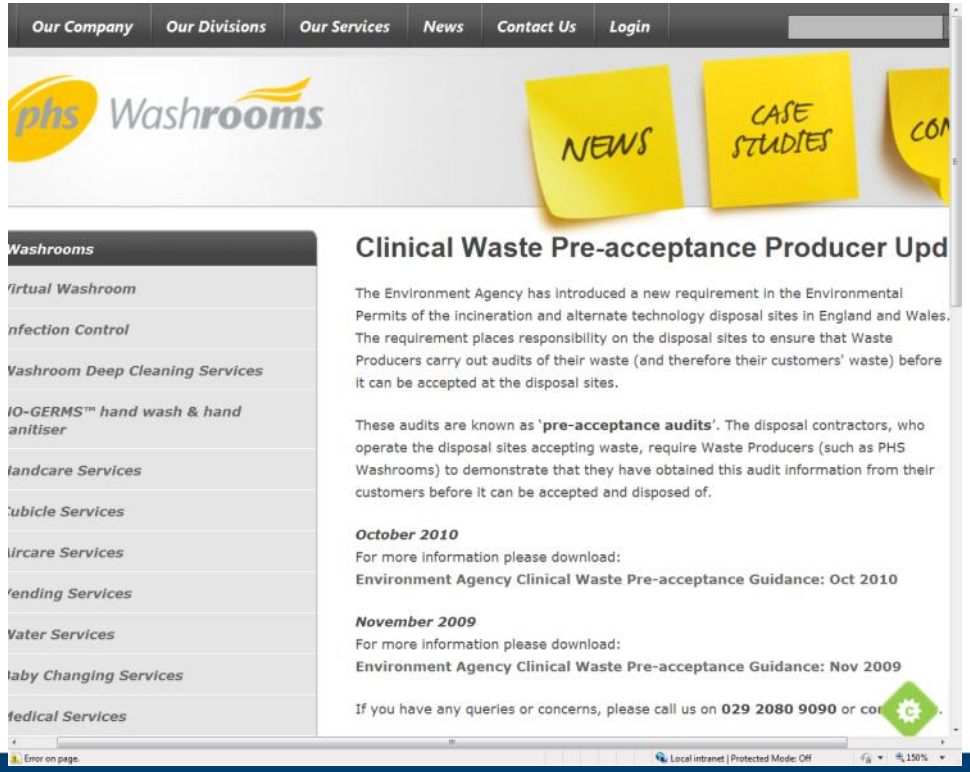
- Clinical waste
- Animal By-Products
- GM Waste: But what Class?



Waste Regulation is Complex

Contractor checks on us via ‘new’

‘Clinical Waste Pre-acceptance Audit’



briefing

Environment Agency

Clinical Waste Pre-acceptance Producer Update – October 2010

This note replaces and updates the information contained in our November 2009 briefing note.

Who does this briefing note apply to ?
This note is aimed at producers of healthcare and related wastes whose waste is accepted at:

- clinical waste incinerators,
- any form of non-incineration treatment,
- IPPC transfer,
- any other waste facility for onward transfer to one of the above.

This includes waste from any of the following producers:

- Hospitals,
- Veterinary practices,
- Dental practices,
- General practices and health centres,
- Community pharmacies,
- Ambulance Trusts,
- Care Homes that provide medical or nursing care,
- Research laboratories that produce clinical waste,
- Any other medical practices,
- Pharmaceutical manufacture and supply.

This does not apply to similar wastes from:

- domestic premises (including both healthcare and non-healthcare wastes),
- care homes that do not provide medical or nursing care, and,
- non-medical producers of clinical waste (for example tattooists, body piercing, minor first aid and wastes arising from substance abuse (drug litter) and other minor non-medical procedures in the hair and beauty industry).

What is waste pre-acceptance ?
Facilities authorised to incinerate or treat clinical wastes are required to assess and have operational access to additional detailed information on the composition of a waste from the producer before they receive it. This information forms part of their 'pre-acceptance' checks. This requirement is not unique to the healthcare sector and is designed to ensure that the waste is properly treated without harm to human health or the environment.

This was previously implemented for clinical waste treatment plants under our S5.06 Appendix 6 guidance issued in 2007. This will be replaced by our new guidance (EPR 5.07) due for re-issue shortly. This new guidance will apply to pre-acceptance checks at;

- clinical waste incinerators and IPPC transfer stations (under existing permit conditions), and
- extend such checks to non-IPPC treatment plants (in some cases the permits may need to be varied to include this).

customer service line 08708 506 506 | incident hotline 0800 80 70 60 | floodline 0845 988 1188
www.environment-agency.gov.uk

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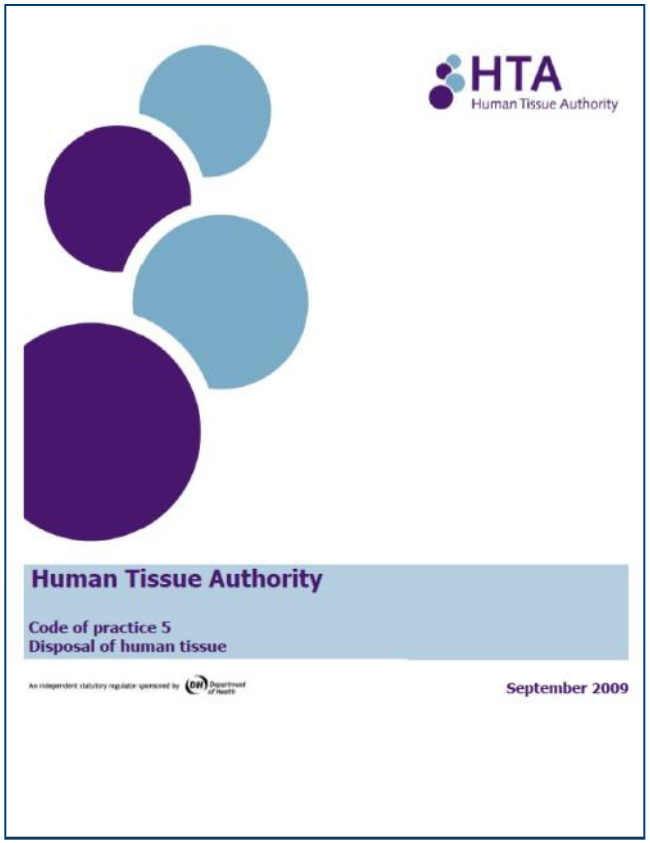
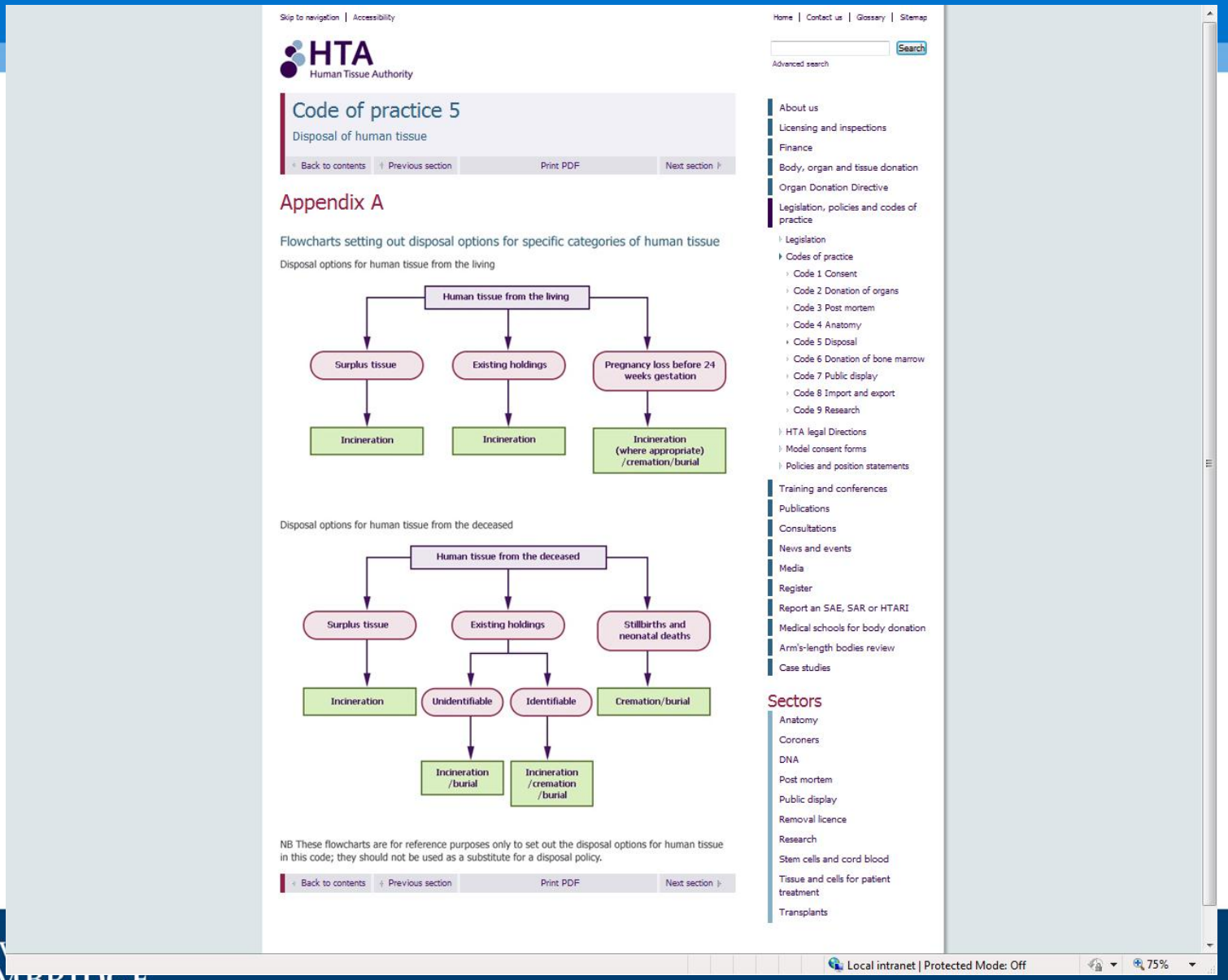
- Special cases e.g.
  - **HTA Human Tissues**
    - Sensitive, respectful disposal
    - Good practice to be bagged separately from clinical waste, but disposed of within the same incinerator. It's not necessary for each tissue sample to be disposed of individually.
  - **Plant & Animal health licenced materials** (Defra / Fera) Autoclave and/or Incinerate



HTA Disposal



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HTA
Human Tissue Authority

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Code of practice 5

Disposal of human tissue

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Appendix A

Flowcharts setting out disposal options for specific categories of human tissue

Disposal options for human tissue from the living

Disposal options for human tissue from the deceased

NB These flowcharts are for reference purposes only to set out the disposal options for human tissue in this code; they should not be used as a substitute for a disposal policy.

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Sectors

- Anatomy
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Waste Regulation is Complex

- EWCs
- Complex consignment notes

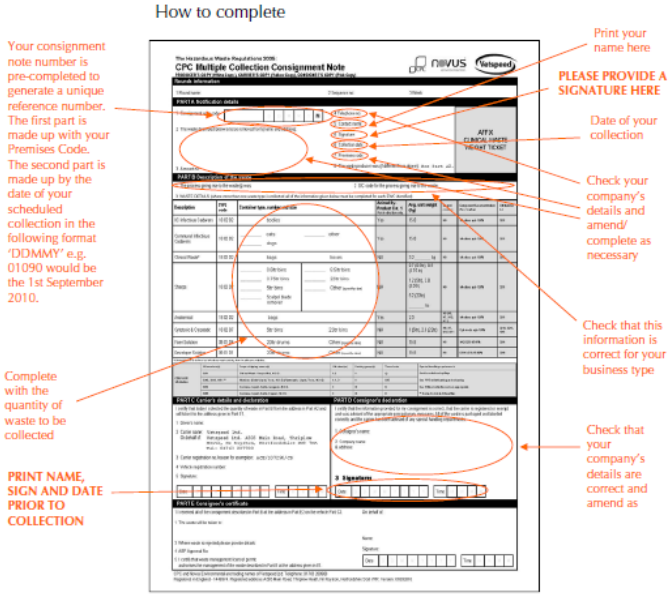
Revised Waste Collection Paperwork

CPC novus environmental Vetspeed

Hazardous Wastes

For the collection of Hazardous Waste please complete a **Consignment Note**

How to complete



Please leave your completed 3-part Consignment Note with your Hazardous Wastes for your driver to collect.

Please note: We will be unable to remove these wastes without correct and completed waste collection paperwork, since doing so would constitute an offence.

For further advice call 01763 207750

Vetspeed Ltd., A505 Main Road, Thriplow Heath, Nr Royston, Hertfordshire SG8 7RR

09 01 04*	Fixer solutions
09 01 05*	Bleach solutions and bleach fixer solutions
09 01 06*	Wastes containing silver from on-site treatment of photographic waste
09 01 07	Photographic film and paper containing silver or silver compounds
09 01 08	Photographic film and paper free of silver or silver compounds

18	**Wastes from human and animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)**
18 01	**Waste 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*	**Waste whose collection and disposal is subject to special requirements in order to prevent infection**
18 01 04	Waste whose collection and disposal is not subject to special requirements in order to prevent infection, e.g. dressings, plaster casts, linen, disposable clothing
18 01 06*	Chemicals consisting of or containing dangerous substances
18 01 07	Chemicals other than those listed 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	**Waste from research, diagnosis, treatment or prevention of disease involving animals**
18 02 01	Sharps except 18 02 02*
18 02 02*	Waste whose collection and disposal is subject to special requirements in order to prevent infection
18 02 03	Waste 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 listed in 18 02 05*
18 02 07*	Cytotoxic and cytostatic medicines
18 02 08	Medicines other than those mentioned in 18 02 07*
20	**Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions**
20 01	**Separately collected fractions (except 15 01)**
20 01 31*	Cytotoxic and cytostatic medicines
20 01 32	Medicines other than those mentioned in 20 01 31*
20 01 99	Other fractions not otherwise specified (used for offensive waste)

*Hazardous wastes can be:

- absolute hazardous entries (in which case they are always hazardous – highlighted red in the Table) or
- mirror entries (which can be either hazardous or non-hazardous depending on their properties – highlighted blue in the Table).

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Waste Regulation is Complex

- Segregation, Colour coding, Labels
- Transport Regs for waste

Safe management of healthcare waste Version 1.0

Yellow with a purple lid 	Incineration	Sharps including those contaminated with cytotoxic and cytostatic medicines
Yellow with a yellow lid 	Incineration	Partially discharged sharps including those contaminated with medicines other than those that are cytotoxic and cytostatic
Yellow with an orange lid 	Incineration or alternative treatment	**For England and Wales:** sharps not contaminated with medicinal products: **for Scotland and Northern Ireland:** either fully discharged or those not used for administering medicines

Safe management of healthcare waste - Safe management of healthcare waste 7658:2.0:England

Colour	Description
Yellow	**Waste which requires disposal by incineration** Indicative treatment/disposal required is **incineration** in a suitably permitted or licensed facility.
Orange	**Waste which may be "treated"** Indicative treatment/disposal required is to be "rendered safe" in a suitably permitted or licensed facility, **usually alternative treatment plants (ATPs). However this waste may also be disposed of by incineration.**
Purple	**Cytotoxic and cytostatic waste** Indicative treatment/disposal required is **incineration** in a suitably permitted or licensed facility.
Yellow/black	**Offensive/hygiene waste*** Indicative treatment/disposal required is **landfill** or municipal **incineration/energy from waste** at a suitably permitted or licensed facility.
Red	**Anatomical waste for incineration**[1] Indicative treatment/disposal required is **incineration** in a suitably permitted facility.
Black	**Domestic (municipal) waste** Minimum treatment/disposal required is **landfill**, municipal **incineration/energy from waste** or other municipal **waste treatment process** at a suitably permitted or licensed facility. Recyclable components should be removed through segregation. Clear/opaque receptacles may also be used for domestic waste.
Blue	**Medicinal waste for incineration**[1] Indicative treatment/disposal required is **incineration** in a suitably permitted facility.
white	**Amalgam waste** For **recovery**

* The use of yellow/black for offensive/hygiene waste was chosen as these colours have historically been universally used for the sanitary/offensive/hygiene waste stream.

1. The colours "red" and "blue" are new to the colour-coding system in this edition. Care should be taken when ordering red containers to ensure that they can be clearly differentiated from orange. The colour-coding could be agreed as part of a contract specification.

Figure 10 Colour coding key to segregation system

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for use in

Waste Regulation is Complex

novus environmental - guide to waste segregation

novus environmental.

correct segregation of waste can save your organisation money and protect environmental health!
For advice on waste handling, segregation and disposal call **0844 770 0012** or email **customer.services@novus-environmental.co.uk**

incineration only

animal by-product waste

Including - non-infectious waste from both human and animal healthcare and infectious waste from animal healthcare only.

Animal EWC Code = 18 02 03
Other EWC Code = 20 01 99

sharps contaminated with medicines

Including - hypodermic needles, syringes and other sharp instruments that have been contaminated with medicines.

Human EWC Code = 18 01 03*
Animal EWC Code = 18 02 02*

cytotoxic and cytostatic waste

Including - cytotoxic substances that are toxic to cells and cytostatic drugs used to suppress cell growth and multiplication.

Human EWC Code = 18 01 08*
Animal EWC Code = 18 02 07*

anatomical waste

Including - any body parts (e.g. infectious limbs & organs), blood bags and infectious body parts from both humans and animals.

Human EWC Code = 18 01 02 / 18 01 03*
Animal EWC Code = 18 02 02* / 18 02 03

meds, glass bottles & vials

Including - prescription only medicines, out-of-date drugs, flu-absorbers and contaminated glass bottles, vials and packaging.

Human EWC Code = 18 01 09
Animal EWC Code = 18 02 08

controlled drugs

Including - anything specified in the Misuse of Drugs Act 1971 and Schedules 1-5 of the Misuse of Drugs Regulations 2001

Human EWC Code = 18 01 09
Animal EWC Code = 18 02 08

permitted treatment or incineration

clinical waste

Including - infectious wastes (e.g. swabs, dressings, bandages, bedding etc.)

Human Code = 18 01 03*
Animal Code = 18 02 02*
Other Code = 20 01 99

sharps not contaminated with medicines

Including - sharps used in the practice of phlebotomy/obtaining blood (e.g. hypodermic needles, scalpel blades, other sharp instruments.)

Human Code = 18 01 03*
Animal Code = 18 02 02*
Other Code = 20 01 99

landfill

offensive waste

Including - non-infectious wastes that are unpleasant and may cause offence to the senses (e.g. nappies, soiled bedding etc.)

Human Code = 18 01 04
Animal Code = 18 02 03
Other Code = 20 01 99

mixed (domestic) waste

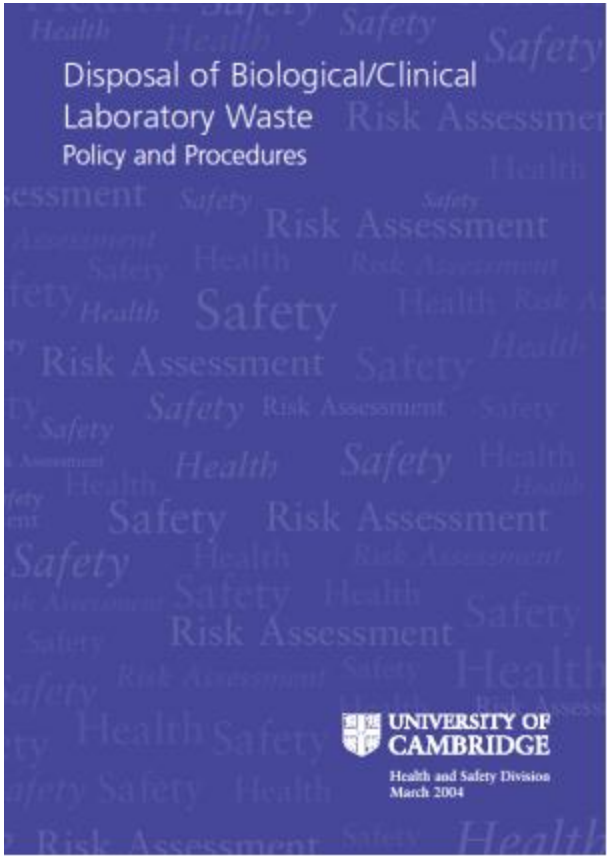
Including - all domestic waste (e.g. newspapers, magazines etc.) (PLEASE RECYCLE WHERE POSSIBLE)

EWC Code = 20 03 01

Explaining European Waste Catalogue (EWC) Codes

Codes marked with an asterisk * are classified as Hazardous Waste. Where a waste is not listed in the EWC Catalogue with an asterisk it is classified as non-hazardous.
The majority of the wastes listed on this poster relate to wastes from Human and Animal Healthcare and/or related research (chapter 18).
Codes 18 01 relate to wastes from natal care, diagnosis, treatment or prevention of disease in humans and Codes 18 02 relate to wastes from research, diagnosis, treatment or prevention of disease involving animals.

Waste Regulation is Complex



Biological Safety

September 2010
Review every 2 years

Waste Inactivation Validation

WEB VERSION

Occupational Health and Safety Service
HSD173B

UNIVERSITY OF CAMBRIDGE

Waste Inactivation Validation

Definitions

Inactivation: 'the complete or partial destruction of genetically modified microorganisms (GMMs) and CL2 organisms ...to provide a high level of protection for humans and the environment'

Validation: Establishing documented evidence that a disinfection process will consistently inactivate target organisms under defined conditions of use.

Sterilisation: A process that renders an object effectively free of viable microorganisms (MOs), including those that may survive disinfection treatments (eg spores, prions).

Disinfection: refers to the use of chemical agents to reduce the potential infectivity of a material, but does not imply the elimination of all viable MOs.

Introduction

There is a requirement under various regulations for microbiological and biological laboratory waste, clinical waste and genetically modified microorganisms and plants to be made biologically inactive. The material can be in different forms and of many types which will require different methods to inactivate it.

Control of substances hazardous to health (COSHH) and genetic modification (GM) risk assessments require information on methods of inactivation plus validation of those methods.

The method used to inactivate the waste needs to be validated to ensure that there is documented evidence that the required level of inactivation has occurred and that this will be consistent each time.

Methods of Inactivation

There are 2 methods of inactivation - physical and chemical. Physical inactivation includes incineration or autoclaving, and chemical inactivation includes use of substances such as alcohols, peroxygen releasing substances (Virkon), aldehydes (Formalin) and hydrogen peroxide.

Physical methods of inactivation are the best way to achieve a high kill rate where sterility is required and both methods - autoclaving and incineration - are relatively easy to validate. Chemical methods of inactivation are more useful where disinfection is required to reduce the potential infectivity of a material, validation of these methods is more complicated.

Problems with Inactivation

There are a number of factors which can affect waste inactivation which would require you to show that your particular method is effective. Some examples of which are:

- The density of the waste to be inactivated can prevent penetration of both steam in autoclaves and disinfectants in chemical inactivation.
- The presence of air pockets can prevent steam penetration and chemical contact.
- Some chemical disinfectants are ineffective in the presence of organic matter eg blood, serum etc. Others quickly lose their efficacy once diluted.

All of these problems emphasise the need to validate your inactivation method under working conditions.

Short, Sharp and to the Point

Sharps

- IVD abuser needles – public areas - toilets, botanic garden etc
- Diabetic needle left in a staff toilet
- Needles for research disposed accidentally or otherwise in waste bags

Vomit – handed in to me in a clinical waste bag for disposal

Food & Drink – in lab bins, including those at CL2

Dear Sir. A letter from Cambridge City Council…

- …regarding discovery of **two syringe sharps** within residual waste which **may** have come from the University... result of hand sampling of waste from all district councils... we are investigating other possibilities as to the source.
- We inspected the waste found today … 5/6 similar red bags containing laboratory waste and **no sharps were found**. We have a **duty to investigate** where there is **concern** that items which **may pose a biological or chemical hazard to human health**, enter the municipal waste stream as well as the **physical dangers of sharps.**

Dear Sir. A letter from Cambridge City Council…

- …look at the photographs of the waste inspected today and confirm whether you believe these are indeed from the University and **provide evidence from the departmental procedures which demonstrate best practice in dealing with waste of this type.**
- **Provide <u>in writing</u> your assurance that the waste types shown pose no risk to human health during it's journey through the waste stream to the disposal point.**

Refuse & Environment
Cambridge City Council

City Council CSI – Deceased GM Flies

No problem: Autoclaved (validated) or Frozen (24hr) as per SOP

City Council CSI – Sharps sent to landfill (Not!)

- Waste owner identified
- Estates/School/Lab investigation
- Nothing wrong here!

- Sterilised by autoclaving
- No sharps identified – just tips, tubes & dead flies
- Tips could be better contained

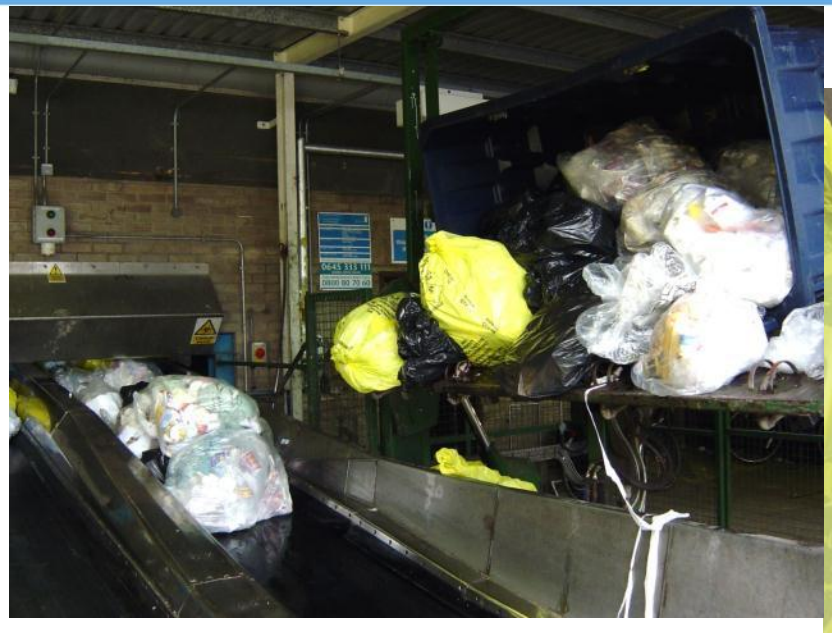
Hazardous liquids?

- Excessive liquids in bags
- Autoclave solid waste cycle not validated for liquids
- What's in the liquid?
- Biological plus drugs

Hazardous liquids?

- Biohazard bags leak easily
- Contaminating floor of autoclave room
- Risking exposure of waste handlers
- Avoid liquids in bags
- Liquid - Decant/aspirate then disinfect and dispose to drain where possible (subject to risk assessment and local arrangements)
- Solid – autoclave and/or incinerate as appropriate – using appropriate bags/bins

Incineration Plant: Biohazards everywhere

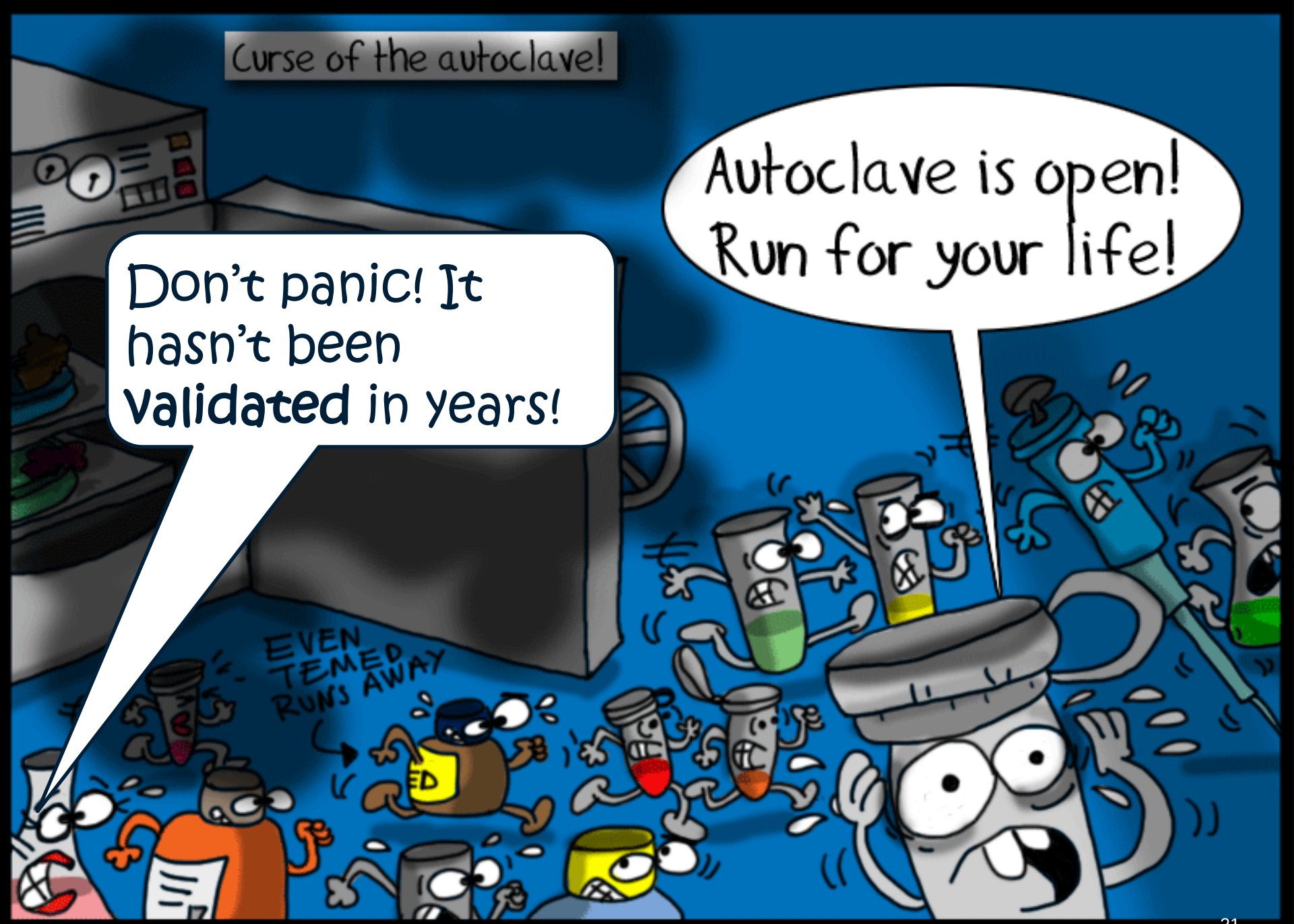


Mixed hazardous waste

Biologically contaminated glass in autoclave bag

Not in the autoclave?

- GM Class 1/2/3/4, CoSHH ACDP HG2/3/4 unless FULLY validated
- Hazardous chemicals
  - Formalin, Phenol/Chlorofom, Methylmethacrylate, Virkon, radioactive
  - Risk assess! Hazard/Concentration/Volume etc
  - Exposure (inhalation or direct contact) of waste handlers
  - Autoclave contamination and damage
- Gas cartridges, aerosols
- Other incompatibles …


Curse of the autoclave!
Don't panic! It hasn't been validated in years!
Autoclave is open! Run for your life!
EVEN TEMED RUNS AWAY
ED

An Elsdon ooooooppppps!

Autoclaved biological waste for landfill

- Don’t use ‘Biohazardous Waste’ labelled bags/containers
- Use unlabelled autoclave bags
- Autoclave tape to monitor
- Waste into robust opaque bags (typically black refuse sacks) before going into bins
- Don’t overfill council bins!
- No ‘clinical looking’ materials e.g syringe barrels, sharps bins, blood bags etc

LaboratoryNews

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BIOHAZARDOUS WASTE DISPOSAL

October 01, 2011 admin No comments

Thermo Fisher Scientific, the world leader in serving science, today introduced Thermo Scientific Sterilin Indicator Autoclave Bags for disposal of biohazardous waste. The bags contain a unique indicator strip that displays "AUTOCLAVED" after completing an autoclave cycle. The new feature eliminates the need for autoclave tape and makes it easy to distinguish between autoclaved and un-autoclaved bags, making waste disposal safer. The large 810x610mm Sterilin Indicator Autoclave Bags are supplied in "tissue box"-style cartons of 200. The easy-to-use bags are suitable for high-temperature waste decontamination autoclave cycles up to 135°C. A choice of cardboard or coated wire bag holders is available to support the bags while they are being filled.

+1 0

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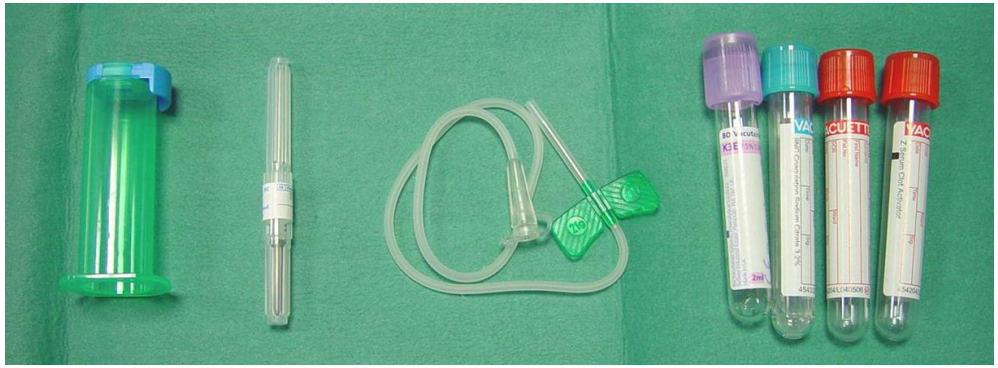
Good idea for internal management of waste however may still result in confusion on a landfill site

Bio-bins

- Bio-bins – a safer alternative to bags for non-sharp ‘pointy’ waste e.g. pipette tips - to landfill (autoclaveable)
- Plain versions for landfill
- Coloured – incineration only

Short, Sharp and to the Point!

Not for landfill – even if sterile!



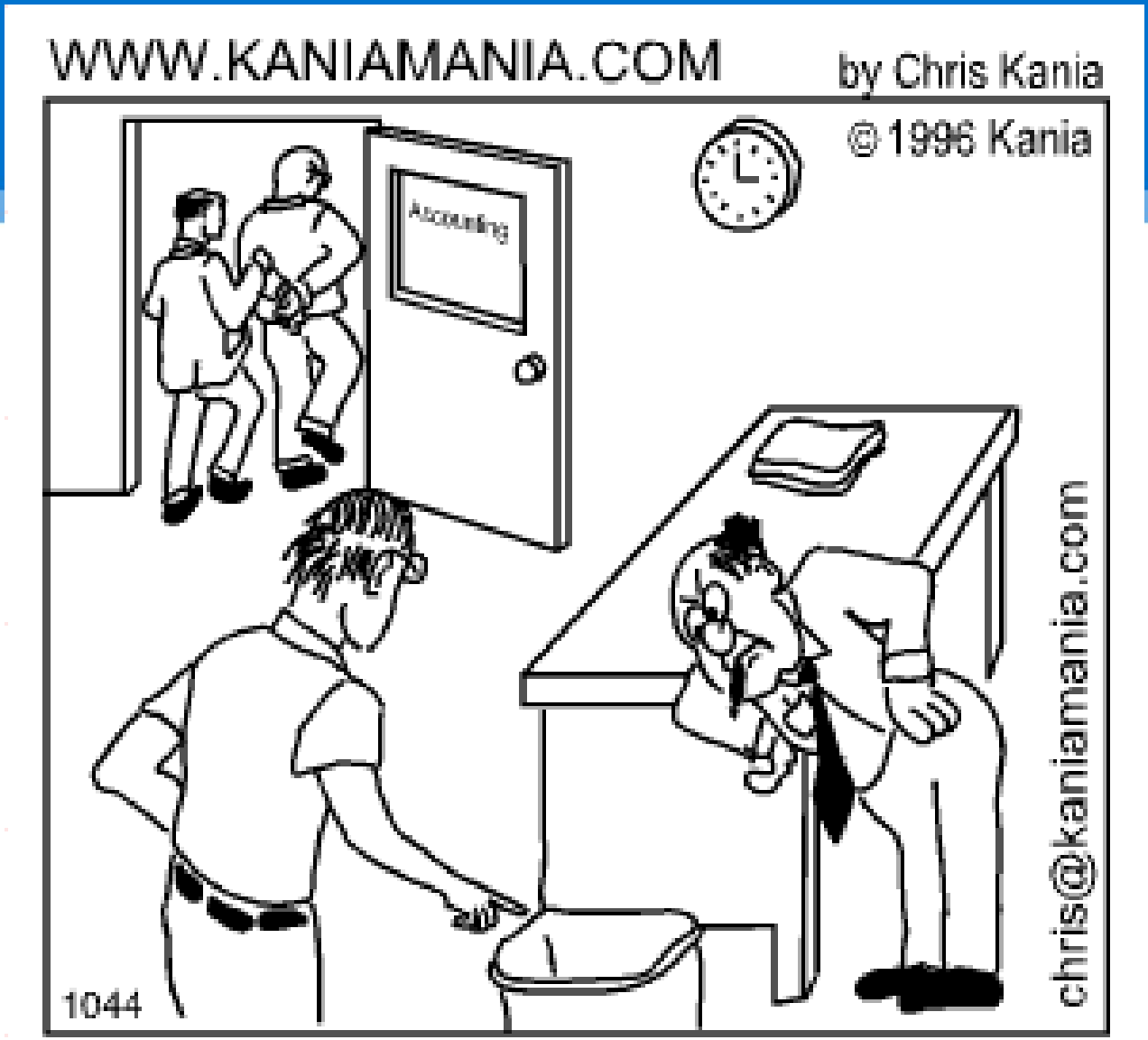
Unacceptable Practice

Landfill

Mobile needle exchange service?

- Student improvised waterproof cycle carrier
- Rented cycle stored in public cycle racks
- Misuse of department safety equipment
- Public perception – not understood by student

Waste Training, Inspections and a Positive Attitude



Incriminating wastebasket evidence, got Arthur fired for using paperclips to clean his nose, a direct violation of office safety policy.