NHS National Services Scotland

Safe Disposal of Waste Literature Review

Evidence Tables

Version 2.0

13 March 2025

ARHAI Scotland

Antimicrobial Resistance and Healthcare Associated Infection

Version history

This literature review will be updated in real time if any significant changes are found in the professional literature or from national guidance/policy.

Version	Date	Summary of changes
1.0	July 2020	Updated using 2-person systematic methodology.
2.0	March 2025	Addition of evidence identified in scheduled three-year update to literature review (V5.0)

Contents

Introduction

All studies which are critically appraised as part of the literature review are assigned a grade of evidence based on the SIGN 50 methodology grading system (SIGN, 2019), which allows scientific studies to be assessed for quality using a number of reviewing forms (available from the SIGN website). Guidelines are appraised and graded using the AGREE II grading system (details available from the AGREE website).

The main conclusions from the evidence sources (studies and guidance) are summarised along with a brief description of the methods and limitations within evidence table entries. Evidence sources with sufficient quality, which specifically answer a defined research question, are grouped together to enable the formation of an overall assessment regarding the evidence base.

Evidence grading

SIGN50 Evidence levels

Grade	Description
1++	High-quality meta-analyses, systematic reviews of RCTs, or RCTs with a very low risk of bias
1+	Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs with a low risk of bias
1-	Meta-analyses, systematic reviews of RCTs, or RCTs with a high risk of bias
2++	High quality systematic reviews of case-control or cohort studies. High-quality case-control or cohort studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is causal
2+	Well conducted case-control or cohort studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal
2-	Case-control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal
3	Non-analytic studies, for example case reports, case series
4	Expert opinion

AGREE II Evidence Levels

Grade	Description
AGREE 'Recommend'	This indicates that the guideline has a high overall quality and that it can be considered for use in practice without modifications.
AGREE 'Recommend with modifications'	This indicates that the guideline has a moderate overall quality. This could be due to insufficient or lacking information in the guideline for some items. If modifications are made the guideline could still be considered for use in practice, in particular when no other guidelines on the same topic are available.
AGREE 'Do not Recommend'	This indicates that the guideline has a low overall quality and serious shortcomings. Therefore, it should not be recommended for use in practice.

Research Questions for Evidence Tables

Question 1: Are there any legislative requirements for the handling and disposal of waste for infection prevention and control purposes?

Evidence added to Literature Review V5.0

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Scottish Government. A Policy for NHS Scotland on the Climate Emergency and Sustainable Development - DL (2021) 38. 2021 [cited 11 December 2023]	Directorate Letter	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This directorate letter supersedes CEL 2 (2012). “A Policy for NHS Scotland on the Global Climate Emergency and Sustainable Development” is attached, which is “mandatory for all NHS Scotland bodies and its scope extends to all of their activities”. “The policy targets minimising NHSScotland’s role in the global climate emergency, hoping to facilitate development of an environmentally and socially sustainable health service that is resilient to the locked-in impacts of climate change”.					

Assessment of evidence
The policy aims to ensure that NHSScotland is contributing to the UN's Sustainable Development Goals, working towards net-zero target by 2040 or earlier, promote resilience, stewardship culture, circular economy and restoring biodiversity. Regarding waste management specifically, "Each NHSScotland body must put in place a system for recording and reporting the volume and type of waste which it generates and the destination of that waste." Waste targets are described: • By 2025 NHSScotland bodies "must" have reduced domestic waste, minimised domestic waste going to landfill, reduced foodwaste and recycle/compost 70% of domestic waste. Specific numerical targets are provided. • NHSScotland bodies "must" set targets to reduce healthcare waste volume and implement better waste segregation, recycling and use more recyclable items. Since, a more extensive strategy document for achieving these targets has been published by the Scottish Government - Supporting documents - NHSScotland climate emergency and sustainability strategy: 2022-2026

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England. Health Technical Memorandum 07-01: Safe and sustainable management of healthcare waste 2022 [cited 23 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Health technical memoranda are described as “comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology” for healthcare delivery. This guidance targets safe and sustainable management of healthcare waste for all NHS Trusts, and laboratories and vet surgeries. it is stated that this best practice guidance is not mandatory unless stated. Where authors have used this wording is indicated in the ETs by “”s. The authors provide the following guidance on these choices of wording: • “must” for legal compliance • “should” for a recommendation that is not mandatory • “may” for permission This guidance replaces the 2013 version, with the aim of supporting compliance with legislative changes and better capturing sustainability goals including the NHS Clinical Waste Strategy. A list of contributors is provided, and a statement thanking those from the “scoping and technical engagement phases” indicating a consultation phase but not much detail is provided on how this guidance was formed, including no indication of systematic methods. Target audience: those involved in NHS waste management (details on relevant sections by job role are signposted in Table 1, p.4), targeted towards compliance with English legislation and regulations so should not be “relied upon” by devolved nations. NHS legislative and policy documents underpinning the guidance are described in Chapter 2. The authors state that Scottish Government targets align with that of NHS England and signpost to the “NHS Scotland Climate Emergency & Sustainability Strategy 2022-2026, Consultation Draft (2021)”. Legislation is described in Chapter 4, with the following Scottish equivalents signposted: • Special Waste Amendment (Scotland) Regulations 2004, implementing the Waste Directive in Scotland • The Environmental Protection (Duty of Care) Regulations (Scotland), where duty of care is required by everyone involved in waste management, meaning producers and others should prevent escape of waste and make sure waste management complies with legislation – “Carrier registrations may be checked in Scotland on the SEPA website”

Assessment of evidence

- SEPA-regulated environmental permits, waste management licenses and exemptions
- Premises registration is not required in Scotland
- Consignment notes for transporting hazardous waste can be purchased from SEPA – not required by law to purchase the note but need to purchase codes
- Hazardous waste producers do not need to register with SEPA, but give 72 hours notice prior to transporting hazardous or special waste. However, notice is not required if waste is staying in Scotland. The authors signpost to the SEPA consigning special waste guidance.
- The authors discuss EWC guidance produced by the EA, NRW and SEPA
- Carriage of Dangerous Goods Regulations regulated by HSE
    - See also The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment (Amendment) (EU Exit) Regulations 2020
- Table 7 outlines relevant health and safety legislation:
    - The Management of Health and Safety at Work Regulations – “Explicitly outline what employers are required to do to manage health and safety, and apply to every work activity”
    - The Public Services (Social Value) Act – “An Act to require public authorities to have regard to economic, social and environmental wellbeing in connection with public services contracts”
    - Actions to facilitate compliance with H&S regulations are outlined in chapter 6
- The Landfill (Scotland) Regulations (2003) are described which prohibit landfilling liquids.

The authors state that to keep up with legislative changes, the gov.uk website should be updated within two weeks of publication of new legislation. Chapter 5 outlines guidance for compliance with legislation described in chapter 4.

Assessment of evidence
Under the EC No 1272/2008 regulation, any sharps or biological material that is contaminated with a dangerous substance is classed as clinical waste. **Limitations:** • The Welsh HTM 07-01 is based on the old 2013 HTM 07-01. However, this current version is also linked out in NHS Wales web pages, so it is not clear if Welsh NHS boards are also to follow this guidance. • Unclear methodology and inconsistent in text citations used

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland Waste Management Guidance: Scottish Health Technical Note 03-01. Version 7.0 2023 [updated 09 December 2024; cited 02 November 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

SHTN 03-01 signposts to and synthesises relevant legislation for waste management in Scottish health and care settings.
 	
This guidance aims to help boards in NHSScotland meet waste management legal, policy, procedural requirements and best practice in Scotland, applicable to NHSScotland healthcare services producing waste, superseding the SHTN 03-01 Parts A to D. It is stated that NHSScotland staff and contractors should not rely on the HTM 07-01 or UK-wide waste management guidance alone due to differing legal requirements across the UK.
 	
Target audience: “staff and contractors involved at all stages of waste management in the modern healthcare setting”
 	
Written by the NHSScotland Waste Management Steering Group. Member names and job titles are not provided.
 	
Endorsed by SEPA.
 	
A disclaimer is provided stating that the guidance is “general” and accurate at time of publication.
 	
Training and audit requirements are also described in chapters 14 and 15 respectively but are out-with the remit of this review.
 	
Compliance under health and safety; environment and waste; and transport regulations is required.
 	
Environment and waste legislation:
 	
• Waste (Scotland) Regulations were introduced in conjunction with Scottish Governments Zero Waste Plan (2010) and the European Union (EU) Waste Framework Directive, amending the following:
  ○ Environmental Protection Act 1990
  ○ Pollution Prevention and Control (Scotland) Regulations 2012
  ○ Landfill (Scotland) Regulations 2003
  ○ Waste Management Licensing (Scotland) Regulations 2011
• As such, waste producers and managers now have new responsibilities under the Duty of Care – signpost to Scottish Government Duty of Care Guidance

Assessment of evidence

Duty of care:

- Compliance with duty of care required for those (responsible for) managing waste under Section 34 of the Environmental Protection Act 1990 as amended by the Waste (Scotland) Regulations 2012 and the Environmental Protection (Duty of Care) (Scotland) Regulations 2014. The authors signpost to the Scottish Government Duty of Care code of practice
- Those who “keep, import or manage controlled waste” in Scotland are required to “prevent the escape of waste”, and “take all reasonable measures to ensure that the waste is dealt with appropriately from the point of production to the point of final disposal” amongst other responsibilities which do not seem to be IPC-specific
- Contracts for managing waste should be set up compliant with NHSScotland staff’s duty of care
- Due diligence (during procurement) and contract monitoring regularly is required
- Waste producer’s responsibilities are described:
    - Apply waste hierarchy to waste management, promoting high quality recycling
    - Minimum source segregation and “presentation of the waste glass, metal, plastic, paper and card (including cardboard)
    - […]
    - “ensuring that your waste is transferred to someone who is authorised to receive it, such as a registered waste carrier or waste manager with the relevant authorisation. Or, if you are carrying your own waste, that you are appropriately registered with Scottish Environmental Protection Agency (SEPA)”
    - “completing a waste transfer note for any transfer of waste, including a full description of the waste, and retaining a copy of this note for two years”
    - “describing the waste accurately and providing information for the safe handling, transport, treatment, recovery or disposal by subsequent holders”
    - “taking reasonable measures to ensure that your waste does not cause pollution or harm to human health”

Assessment of evidence

Recycling
• "All waste producers must take all reasonable steps to apply the waste hierarchy to the management of their waste and promote 'high quality recycling' of the materials separately collected. Waste producers must take all reasonable steps to ensure that at least metals, glass, plastics, paper and card are presented for collection and subsequent recycling."
• Waste Scotland Regulations 2012 "mandates the requirement for all organisations to present source segregated waste for recycling"
Legislative requirements for Persistent Organic Pollutants (p.4), food waste (p.5), municipal waste treatment and disposal (p.5) are described.
Waste licensing is described (p.7)
Health and safety legislation:
• Regulated by HSE in the UK
• Based on risk assessment
• COSHH 2002 and the Management of Health and Safety at Work Regulations 1999 "require those dealing with potentially infectious substances (including waste) to assess the risk to the public and staff who may come into contact with it"
• COSHH 2002 – "set out the duty of employers to manage the risk of exposure to hazardous substances, including healthcare waste". Requirements for employers are as follows:
  ○ "assess the risks to employees and others from hazardous substances, including healthcare waste
  ○ make arrangements for reviewing the assessment as and when necessary, but at no less than two-yearly intervals - and sooner if there is any reason to suggest the risk assessment is no longer valid
  ○ aim to eliminate or prevent these risks and, if this is not possible, to control the risks adequately
  ○ provide suitable and sufficient information, instruction and training for employees about the risks

Assessment of evidence
○ provide health surveillance and immunisation where appropriate” • Management of Health and Safety at Work Regulations 1999 – “a framework for managing risks at work, including risks from healthcare waste not covered by more specific requirements such as COSHH”. Requirements for employers are as follows: ○ “make a suitable and sufficient assessment of the risks to employees and others. If they have five or more employees, they must record the significant findings of the assessment ○ take particular account in their assessment of risks to new and expectant mothers and their unborn and breast-feeding children ○ take particular account in their assessment of risks to young people ○ make arrangements for the effective planning, organisation and control of risks ○ monitor and review any precautions ○ provide health surveillance where appropriate ○ have access to competent health and safety advice provide information for employees ○ co-operate with other employers who may share the workplace” • The Health and Safety (Consultation with Employees) Regulations 1996 and the Safety Representatives and Safety Committees Regulations 1977 are described regarding employers consulting with employees re: health and safety at work (p.10) • Genetically Modified Organisms (Contained Use) Regulations are described (p.10) Transport: • Based on hazard and risk assessment, where “substances (including waste) are classified according to their primary hazard” • The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 – “subject to regulatory control”. “intended to reduce to reasonable levels the risk of harm or damage to people, property and the environment posed by the carriage of dangerous goods.”, where dangerous goods are “substances with intrinsic hazards posing a potential risk to persons or

Assessment of evidence

the environment while in the transport chain." Do not regulate waste materials specifically but rather all dangerous goods depending on hazardous characteristics and classification (nine classes) which then influences packaging, labelling and transport requirements. Table 1.1. describes these nine UN classifications, hazard warning label and examples specific to healthcare
• "The Carriage Regulations make direct reference to ADR, RID and IMDG. The UK Carriage Regulations are reviewed and, if required, updated bi-annually to reflect changes in ADR, RID and IMDG."
• It is stated that the Carriage Regulations reference the ADR to address:
  ○ "training of personnel involved in the chain of distribution
  ○ substance clarification and identification
  ○ packaging
  ○ marking, labelling and documentation
  ○ safety equipment and emergency procedures
  ○ safe loading
  ○ vehicle specification and operation"
• The Radioactive Material (Road Transport) Regulations 2002 is described (p.15)
Procurement:
• Requirements under procurement regulations are described e.g. considering the entire life cycle of an item (p.15)
Waste management policies should address legal obligations under health and safety, environment (waste) and transportation legislation.
Under the Duty of Care, The Landfill (Scotland) Regulations 2003 and the Special Waste Amendment (Scotland) Regulations 2004, producers should describe waste "adequately using both a written description and the use of appropriate EWC code(s)".
EWC by the European Commission alongside the "revised European Framework Directive (2008/98/EC)", which provides common terminology for Europe. Includes the European Hazardous Waste List.

Assessment of evidence
The Special Waste Regulations 1996 (as amended) “define and regulate the segregation and movement of special waste in Scotland from the point of production to the final point of disposal or recovery. These Regulations, among other things, require producers of special (hazardous) waste to complete consignment notes restricts the mixing of special/hazardous wastes (unless authorised in a licence/ permit”. The authors signpost to SEPA guidance on consigning special waste.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Scottish Government. Duty of Care – A Code of Practice. 2012 [cited 25 August 2023]	Guidance for legislation	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Duty of Care is a legal requirement for handling waste, as described in SHTN 03-01 (see above entry). This guidance describes these legal responsibilities. This statutory guidance document produced by the Scottish Government outlines duties for controlled waste producers, keepers, importers and/or managers in Scotland under Section 34 of the Environmental Protection Act 1990 (as amended). Published in 2012 but has regulatory requirements for 2014 onwards, in line with the implementation of The Environmental Protection (Duty of Care) (Scotland) Regulations 2014. The authors explain that this document is intended to address waste management based on a person’s role in the Duty of Care.

Assessment of evidence

Waste producer obligations

A waste producer is “any person (with the exception of an occupier of domestic property in respect of waste produced on that property) who produces waste in the course of their activities”, and the authors state that they have the most important role in waste management, as they are best suited to describe the waste accurately, and therefore its’ safe management through the latter stages of the waste management process.

To comply with Section 34, “as a waste producer, you must:”

- “Take steps to maintain the quality of dry recyclables presented for separate collection.”
- “Take care of the waste while you hold it so it does not escape from your control.
- […]
- Describe the waste accurately and provide information for the safe handling, transport, treatment, recovery or disposal by subsequent holders.
- Take reasonable measures to ensure that your waste does not cause pollution or harm to human health.”

The requirements of waste producers to segregate recycling applying the waste hierarchy and food waste.

In terms of preventing waste escape:

- “You must not allow waste to escape from your control and that of your employees, or the control of others during subsequent transportation.”
- As such, waste holders should “act to keep waste safe against: Spillages from corrosion or wear and tear of containers; accidental spilling or leaking or inadvertent leaching from waste unprotected from rainfall; accident or weather breaking contained waste open and allowing it to escape; waste blowing away or falling while stored or transported; scavenging of waste by vandals, thieves or animals.”

Assessment of evidence
To prevent waste causing harm or pollution through improper management, waste should not be allowed to escape the producer's control, e.g. by leaking from containers, checking that a carrier subsequently handles it safely. **Limitations** • Not health and social care specific • Large focus on recycling/repurposing – Zero Waste Plan • Not focused on IPC or infectious waste

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Control of Substances Hazardous to Health Regulations 2002 2002 [cited 24 August 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
COSHH regulations address safe handling, storage and transport of waste containing substances hazardous to health in the workplace. In the Explanatory Note, it is stated that "These Regulations re-enact, with modifications, the Control of Substances Hazardous to Health Regulations 1999 (S.I. 1999/437) ("the 1999 Regulations"). The 1999 Regulations imposed duties on employers to protect employees and other persons who may be exposed to substances hazardous to health and also imposed certain duties on employees concerning their own protection from such exposure, and prohibited the import into the United Kingdom of certain substances and articles from outside the European Economic Area."					

Assessment of evidence
Regulation 7 Prevention or control of exposure to substances hazardous to health; COSHH requires that: 1. “Every employer shall ensure that the exposure of his employees to substances hazardous to health is either prevented or, where this is not reasonably practicable, adequately controlled.” 3. “Where it is not reasonably practicable to prevent exposure to a substance hazardous to health, the employer shall comply with his duty of control under paragraph (1) by applying protection measures appropriate to the activity and consistent with the risk assessment, including, in order of priority - (a) The design and use of appropriate work processes, systems and engineering controls and the provision and use of suitable work equipment and materials; (b) the control of exposure at source, including adequate ventilation systems and appropriate organisational measures; and (c) where adequate control of exposure cannot be achieved by other means, the provision of suitable personal protective equipment in addition to the measures required by sub-paragraphs (a) and (b).” 4. “The measures referred to in paragraph (3) shall include - (a) arrangements for the safe handling, storage and transport of substances hazardous to health, and of waste containing such substances and be provided with appropriate hygiene measures including adequate washing facilities at the workplace.”

Evidence from previous update(s):

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. The Control of Substances Hazardous to Health Regulations 2002 (as Amended) Approved Code of Practice and Guidance 2013 [cited 24 August 2023]	Guidance for legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence

This HSE guidance provides recommendations supporting compliance with COSHH regulations.

This document by HSE provides methods for compliance with the Control of Substances Hazardous to Health Regulations 2002 (as amended) (COSHH). List of amendments on p.5, including Control of Substances Hazardous to Health (Amendment) Regulations 2004 (SI 2004/3386). The target audience is duty holders and health and safety professionals.

ACOP:

- The authors explain that employers should firstly consider hazardous substance exposure in terms of eliminating these substances hazardous to health. Where this is not possible, options for reducing exposure should be considered. Where hazardous substance exposure cannot be prevented, employers should apply regulations 7(3) and 7(4) (p.29)

Assessment of evidence
• "The employer should consider the way employees will use the controls when making decisions about their design, installation and use. […] Employers should also consider the arrangements for the safe handling, storage and transport of hazardous substances, of waste containing such substances, and suitable maintenance procedures etc." • For control of biological agent exposure, employers should "adequately" control exposure (see 7(3-7)), not all regulation 7(6) measures will be requited for "incidental" exposure, and if vaccines are readily available, they should be offered • PPE may be required if good practice is not sufficient to control exposure Guidance: • HSE describe the objective of COSHH as "to prevent, or adequately control, exposure to substances hazardous to health so as to prevent ill health" • The principles from regulation 7(1) are described with associated guidance (p.30)

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Environmental Protection Act 1990 1990 [cited 12 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 as applicable to waste disposal in Scottish health and care settings (see above entry). "An Act to make provision for the improved control of pollution arising from certain industrial and other processes"					

Assessment of evidence
Section 34 relating to Duty of Care states that: “it shall be the duty of any person who imports, produces, [F1018keeps or manages] controlled waste or, as a broker [F1019or dealer] , has control of such waste, to take all such measures applicable to him in that capacity as are reasonable in the circumstances” “(a) to prevent any contravention by any other person of subsection (2A), (2E), (2F), (2I) or (2K);] (b) to prevent the escape of the waste from his control or that of any other person;” “(c) on the transfer of the waste, to secure— (i) that the transfer is only to an authorised person or to a person for authorised transport purposes; and (ii) that there is transferred such a written description of the waste as will enable other persons to avoid a contravention of that section [F1026or any condition of a permit granted under regulation 7 of those Regulations]and to comply with the duty under this subsection as respects the escape of waste.” “(2A) It shall be the duty of any person who produces, keeps or manages controlled waste, or as a broker or dealer has control of such waste, to take all such measures available to that person as are reasonable in the circumstances to apply the waste hierarchy set out in Article 4(1) of the [F1029Waste Framework Directive].” “(2E) It shall, from 1st January 2014, be the duty of any person who produces controlled waste (other than an occupier of domestic property as respects household waste produced on the property) to take all reasonable steps to ensure the separate collection of dry recyclable waste” “(2I) It shall be the duty of any person who transports controlled waste to collect and transport separately from other waste any waste presented— (a) for collection in accordance with subsection (2E) or (2F); (b) for collection in a receptacle provided under an arrangement made in accordance with section 45C(2) or (5).” “(2L) It shall be the duty of any person who produces or manages controlled waste, or who as a broker or dealer has control of such waste, to take all reasonable steps to— (a) ensure that the waste meets any quality standard for the management of material included in the waste; (b) ensure that the waste is managed in a manner that promotes high quality recycling; and

Assessment of evidence
(c) prevent any contravention by another person of this subsection.]” This legislation is not specific to health and care settings, but Section 34 is specific to Scotland. See above SHTN 03-01 entries which describes this legislation in relation to waste management in Scottish health and care settings and the Scottish Government statutory guidance document on the Duty of Care.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Environmental Protection (Duty of Care) (Scotland) Regulations 2014 2014 [cited 12 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence
This legislation is signposted in SHTN 03-01 as applicable to waste disposal in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that “Section 34(1) of the Environmental Protection Act 1990 (“the 1990 Act”) imposes a duty on any person who imports, produces, keeps or manages controlled waste, or who as broker or dealer has control of such waste, to take such measures on the transfer of the waste as are reasonable in the circumstances to secure that there is transferred with the waste such a written description of the waste as will enable other persons to avoid a contravention of any duty under that section or under section 33 of the 1990 Act.” Applicability of this legislation in Scottish health and social care settings is described in SHTN 03-01 and the Scottish Government Duty of Care Code of Practice guidance (see above entries).

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Waste (Scotland) Regulations 2012 2012 [cited 06 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 as applicable to waste disposal in Scottish health and care settings (see above entry). In the explanatory note, it is stated that “These Regulations provide for the collection, transport and treatment of dry recyclable waste and food waste, and for related matters.” And “They transpose Articles 11(1) (re-use and recycling) and 22 (bio-waste) of Directive 2008/98/EC on waste (OJ L 312, 22.11.2008, p.3) (“the Directive”), and generally make provision connected with the implementation of requirements under European Union waste management legislation.” In the Explanatory Note, it is stated that “Regulation 2 amends the Environmental Protection Act 1990 […] to provide for the separate collection of dry recyclable waste and food waste, and for the treatment of such wastes and of controlled waste generally” and that Regulation 2 “amends section 34(1) of the 1990 Act to align the descriptions of waste activities in that subsection with the definitions of such activities in section 29(5A) of that Act […] to create a duty on persons carrying out waste activities to prevent a contravention by another person of a duty in section 34”. For information on how these Regulations are applicable in Scottish healthcare settings, please see evidence table entries for SHTN 03-01. Further information on how these regulations relate to other waste legislation can be found in the evidence table entry for the Scottish Government guidance for compliance with Duty of Care.					

Question 2: What are the categories of waste in health and care settings?

Evidence added to Literature Review V5.0

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Safe management of wastes from health-care activities, 2nd ed. 2014 [cited 15 September]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This WHO guidance provides guidance on safe handling and disposal of waste from health care globally, also addressing waste management options for developing countries. This second addition of 'The Blue Book' updates guidance from 2007.

This guidance comprises of expert opinion from "internal consultation and collaboration" at a conference in 2007, with peer-review of each chapter from experts worldwide. Names of those who contributed to the first edition are provided in appendix 1.

Target audience: "medical staff, health-care facility directors, ancillary health workers, infection-control officers and waste workers […] regulators, policy-makers, development organizations, voluntary groups, environmental bodies, environmental health practitioners, advisers, researchers and students"

Health-care waste is defined by the WHO as "all the waste generated within health-care facilities, research centres and laboratories related to medical procedures" from a wide range of procedures from healthcare settings to the home.

Table 2.1 provides definitions of different waste categories:

Assessment of evidence

- Sharps waste – “Used or unused sharps (e.g. hypodermic, intravenous or other needles; auto-disable syringes; syringes with attached needles; infusion sets; scalpels; pipettes; knives; blades; broken glass)”. This type of waste is considered hazardous regardless of whether it infectious.
- Infectious waste – “Waste suspected to contain pathogens and that poses a risk of disease transmission […] (e.g. waste contaminated with blood and other body fluids; laboratory cultures and microbiological stocks; waste including excreta and other materials that have been in contact with patients infected with highly infectious diseases in isolation wards”. Further examples are provided in section 2.1.2.
- Pathological waste – “Human tissues, organs or fluids; body parts; fetuses; unused blood products”, category of infectious waste. “Anatomical waste” can sometimes be used to describe recognisable human or animal parts.
- Pharmaceutical waste – “Pharmaceuticals that are expired or no longer needed; items contaminated by or containing pharmaceuticals”. Further examples are provided in section 2.3.
- Cytotoxic waste – “Cytotoxic waste containing substances with genotoxic properties (e.g. waste containing cytostatic drugs – often used in cancer therapy; genotoxic chemicals)”. Further examples are provided in section 2.3.
- Chemical waste – “Waste containing chemical substances (e.g. laboratory reagents; film developer; disinfectants that are expired or no longer needed; solvents; waste with high content of heavy metals, e.g. batteries; broken thermometers and blood-pressure gauges)”. Further examples are provided in section 2.4.
- Radioactive waste – “Waste containing radioactive substances (e.g. unused liquids from radiotherapy or laboratory research; contaminated glassware, packages or absorbent paper; urine and excreta from patients treated or tested with unsealed radionuclides; sealed sources)”. Further examples are provided in section 2.5.
- Non-hazardous or general health-care waste – “Waste that does not pose any particular biological, chemical, radioactive or physical hazard”

The authors state that all healthcare workers handling waste should be aware of the main categories.

Assessment of evidence
Limitations • This guidance is from 2014 so some guidelines may be out of date

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
SEPA, Environment Agency and National Resources Wales. Waste Classification: Guidance on the classification and assessment of waste (1st Edition v1.2.GB) Technical Guidance WM3. 2015 [updated October 2021; cited 19 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This guidance is signposted as it provides guidance on categorisation of healthcare waste under the Waste Framework Directive. The aim of this guidance is to provide information on how to assess the hazardous properties of waste and therefore how it should be classified. This update is for Scotland, England and Wales and captures changes since leaving the EU.

Assessment of evidence
Under the Duty of Care, waste should be classified “before it is collected, disposed of or recovered”. Hazardous properties of the waste will need to be deciphered before it’s classified. Chapter 2 addresses “Waste classification and assessment”: Waste classifications to describe waste should be deciphered before waste is moved, disposed of or recovered so that it can be noted on waste records. It “determines the controls that apply to movement of the waste” and “is needed to identify a suitably authorised waste management option”. A link for waste classifications for England is provided (see above UK Gov entry). This guidance describes how to assess and classify waste. Examples of how to apply the coding are provided in the appendices.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Scottish Environment Protection Agency. Guidance on using the European Waste Catalogue (EWC) to code waste 2015 [cited 19 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This guidance is signposted as it describes the European Waste Catalogue codes which are required by legislation.					

Assessment of evidence
This guidance by SEPA for waste management site operators, waste carriers and waste producers outlines how to use the European Waste Catalogue to describe waste for reports including waste transfer notes and special waste consignment notes. Guidance on how to use the EWC is provided, and the document signposts to the WM3 technical guidance for classifying and assessing hazardous (special) waste. “Duty of Care requires that waste must be managed correctly by storing it properly, only transferring it to the appropriate persons and ensuring that when it is transferred it is sufficiently well described to enable its safe recovery or disposal without harming the environment. When waste is transferred a waste transfer note or a special waste consignment note is required” the authors then signpost to the SG DoC Code of Practice.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Council of the European Union. Commission Decision of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of	Legislation	**Mandatory**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (notified under document number C(2000) 1147) (Text with EEA relevance) (2000/532/EC). 2000 [cited 19 September 2023]					
Assessment of evidence					
This legislative document is referenced by the SEPA guidance on the EWC as containing the “List of Wastes Decision” Makes reference to Directive 2008/98/EC (Waste Framework Directive) The index of this legislation contains the list of waste and corresponding codes. Note the following caveat – “Changes to legislation: There are outstanding changes not yet made to Commission Decision of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/ EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (notified under document number C(2000) 1147) (Text with EEA relevance) (2000/532/EC). Any changes that have already been made to the legislation appear in the content and are referenced with annotations. (See end of Document for details) View outstanding changes”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. Health and safety in care homes 2014 [cited 21 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This HSE guidance is aimed at outlining care home risks and methods of managing these risks. This guidance is not mandatory but the authors advise that compliance with the guidance should facilitate compliance with the law. Target audience: those “providing and managing care homes” and those working in social care. Hazardous waste is described as waste produced when there is known or suspected infection.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Infection prevention and control guideline for Ebola and Marburg disease 2023 [cited 10 November 2023]	Guideline	**AGREE II Recommend with Modifications**	N/A	N/A	N/A

Assessment of evidence
Healthcare waste categories are mentioned in this guideline. Guideline “provides IPC recommendations for Ebola and Marburg disease outbreaks” with a healthcare focus and wider consideration of community settings. These recommendations should be followed during readiness or response activities. Core and development team members and affiliations are listed, including methodology experts. New evidence should result in updates (no timeline provided). Previous update recommendations have been incorporated alongside new evidence and a distinction made where appropriate. Intended audience: “policy-makers, health-care administrators and managers, IPC specialists, logisticians, community workers, burial teams and all health and care workers.” Methods: a “guideline development group” made of diverse backgrounds and an “external peer-review group” were involved in the review and consultation process. GRADE was used to appraise appropriate evidence. Systematic reviews from previous updates were summarised and their recommendations incorporated where appropriate. This 2023 update involved a series of studies: systematic review, rapid reviews, scoping review and mixed methods study. The systematic review was used for an AGREE II appraisal and graded AGREE Recommend with Modifications, based on ARHAI criteria. Although the WHO do not specifically define healthcare waste categories in this guideline, justification for managing Ebola/Marburg disease as infectious waste reads: “There are well-established, globally recognized categories of health-care waste. Considering these established categories and the survivability of the Ebolavirus and Marburg virus in the environment, the GDG judged that a good practice statement classifying such waste as infectious waste was warranted.” **Limitations** • These are global recommendations and will be applicable to Scottish health and care settings if there were an outbreak of Ebola virus or Marburg disease. • Poor distinction between methodologies and findings of each development process different studies carried out. • Poor reporting of search strategies, time ranges and inclusion/exclusion criteria. • Poor description of populations likely influenced by the content of these guidelines.

Assessment of evidence
• No statement of influence of funding bodies. • Tools are yet to be published. • Timeline and methods for update are not provided.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Standards New Zealand. Management of Healthcare Waste 2002 [cited 22 September 2023]	Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Waste definitions are provided in this standard. This New Zealand standard contains best practice guidance (beyond legislative requirements) on human and animal healthcare waste disposal including classification, segregation, packaging/containment, labelling, storage and transport, where healthcare waste refers to all waste produced by a healthcare facility. These standards aim to assist compliance with regulations and best practice in healthcare waste management. Controlled waste is defined as healthcare waste from a facility contaminated with infectious substances “which shall not be expressible under compaction” or waste that does not pose an infection risk but is “culturally or aesthetically offensive”. Hazardous waste is described as a part of the waste stream which may pose risk to public health or the environment. Infectious waste is described as waste containing (or suspected to contain) pathogens.

Assessment of evidence
Other hazardous waste is waste that is hazardous but not infectious, cytotoxic or radioactive. Non-hazardous waste is waste that is does not conform to definitions of controlled or hazardous waste. How healthcare waste should be categorised is described: • Hazardous: initially to be categorised as sharps or non-sharps. Sharps are further categorised as radioactive, cytotoxic or infectious. Meanwhile, hazardous non-sharps waste may be categorised as infectious, radioactive, cytotoxic, other hazardous or body parts. • Controlled • Non-hazardous: should be categorised as recyclable or general waste. It is stated that waste which does not conform to a single category should be categorised into the highest risk category to which it conforms. Waste stream is defined as: “A single or multiple selection of waste managed as a single entity rather than by components. A waste stream may comprise waste from a subset of one category, waste from a single category, or waste from two or more categories. Where waste from two or more categories is managed as a single stream, the management controls shall be the most stringent requirements for all the categories present.” Non-segregated waste should be categorised as the highest risk category. **Limitations** • From 2002 so may not be reflective of current best practice • How best practice determined not clear • Guidance for compliance with NZ legislation

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England. Health Technical Memorandum 07-01: Safe and sustainable management of healthcare waste 2022 [cited 23 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

HTM 07-01 provides definitions for types of waste and the relationships between them. Clinical risk assessment to determine infectivity of waste is also addressed.

Health technical memoranda are described as “comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology” for healthcare delivery. This guidance targets safe and sustainable management of healthcare waste for all NHS Trusts, and laboratories and vet surgeries.

it is stated that this best practice guidance is not mandatory unless stated. Where authors have used this wording is indicated in the ETs by “”s. The authors provide the following guidance on these choices of wording:

- “must” for legal compliance
- “should” for a recommendation that is not mandatory
- “may” for permission

This guidance replaces the 2013 version, with the aim of supporting compliance with legislative changes and better capturing sustainability goals including the NHS Clinical Waste Strategy.

Assessment of evidence

A list of contributors is provided, and a statement thanking those from the "scoping and technical engagement phases" indicating a consultation phase but not much detail is provided on how this guidance was formed, including no indication of systematic methods.

Target audience: those involved in NHS waste management (details on relevant sections by job role are signposted in Table 1, p.4), targeted towards compliance with English legislation and regulations so should not be "relied upon" by devolved nations.

Healthcare waste is defined as "waste produced during human or animal healthcare, or related research activities. All wastes produced in a healthcare setting are healthcare wastes". This definition includes clinical waste and non-infectious items.

Under English legislation, clinical waste is made up of infectious healthcare waste, hazardous healthcare waste and (substances contaminated with) medicines.

To determine infectivity of waste: "When assessing whether the healthcare waste should be classed as infectious or not, consideration must be given to the medical history of the patient, where available, and any clinical signs and symptoms indicating a potential infectious risk. The assessment for infectious properties of the waste must be made at the time the waste is generated."

On p.44, a Venn diagram is provided demonstrating relationships between waste "types", containing the following:

- Non-hazardous – uncontaminated gypsum, confidential waste, recyclable waste, domestic waste, offensive waste
- Clinical and non-hazardous waste – medicinally contaminated sharps, non cytotoxic/cytostatic medicine waste, non-infectious anatomical waste without chemicals and uncontaminated sharps
- Clinical and hazardous waste – cytotoxic/cytostatic waste or sharps, hazardous anatomical waste, infectious and contaminated with medicines, infectious medicinally contaminated sharps, infectious and contaminated with chemicals, known infectious waste and used, non medicinally contaminated sharps
- Clinical, hazardous and dental – infectious waste containing dental amalgam and infectious gypsum
- Hazardous and dental – dental amalgam and xray fixer and developer
- Hazardous – very low level radioactive waste, low-level radioactive waste and radioactive solid waste

Assessment of evidence
Guidance for offensive waste is provided: • Offensive waste is described as non-clinical, non-infectious and non-hazardous (18 01 04 from healthcare) • Offensive waste is considered such as it omits an unpleasant odour or appearance, but not all offensive waste items have to conform to this requirement (see Figure 16 for examples) **Limitations** • The Welsh HTM 07-01 is based on the old 2013 HTM 07-01. However, this current version is also linked out in NHS Wales web pages, so it is not clear if Welsh NHS boards are also to follow this guidance. • Unclear methodology and inconsistent in text citations used.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland Waste Management Guidance: Scottish Health Technical Note 03-01. Version 7.0 2023 [updated 09 December 2024; cited 02 November 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
SHTN 03-01 describes waste categorisation to be implemented in Scottish health and care settings. This guidance aims to help boards in NHSScotland meet waste management legal, policy, procedural requirements and best practice in Scotland, applicable to NHSScotland healthcare services producing waste, superseding the SHTN 03-01 Parts A to D. It is stated that NHSScotland staff and contractors should not rely on the HTM 07-01 or UK-wide waste management guidance alone due to differing legal requirements across the UK. Target audience: “staff and contractors involved at all stages of waste management in the modern healthcare setting” Written by the NHSScotland Waste Management Steering Group. Member names and job titles are not provided. Endorsed by SEPA. A disclaimer is provided stating that the guidance is “general” and accurate at time of publication. Training and audit requirements are also described in chapters 14 and 15 respectively but are out-with the remit of this review. “special waste” is the term used in Scotland, in line with the Special Waste Regulations 1996 (as amended), implementing the European Waste Framework Directive. The term “special waste” is equivalent to “hazardous waste”. “dangerous goods” refers to substances “with intrinsic hazards posing a potential risk to persons or the environment while in the transport chain” (UN criteria, addressed in GB under Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009) The waste framework directive defines waste as “any substance or object the holder discards, intends to or is required to discard” “Waste regulation requires the classification of waste on the basis of hazardous characteristics and point of production” Table 3.1 provides examples of hazardous (special) versus non-hazardous waste, including infectious or potentially infectious waste as hazardous “When classifying special waste in Scotland, it is normal practice to only use a single EWC code that reflects its characteristics (and where it has more than one characteristic, the code relating to the highest level of protection and disposal must be used). However, in all cases, an adequate written description is still required, as well as reference to all relevant HP codes”

Assessment of evidence
"Waste which is known or suspected to pose a risk of infection is classified as a special (hazardous) waste. WM3 defines HP9 'Infectious' as "substances and preparations containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms."", however, it is not always possible to determine pathogens or toxins present within the waste so clinical assessment should be applied to determine infection risk. Infectious waste therefore includes clinical waste (waste with risk of infection) Classifying infectious waste for transport: • Under ADR, infectious waste is classified as Category A (UN 2814, UN2900 and UN3549) if "an infectious substance which is transported in a form that, when exposure to it occurs, is capable of causing permanent disability, life-threatening or fatal disease to humans or animals". However, the authors state that generally UN 2814 and UN2900 tend to be used for laboratory or research waste, whereas UN3549 is for patient waste. Category B waste (UN3291 and UN3373) is used for infectious substance that does not fall under category A. A footnote is provided that states that waste which poses risk of infection should be assigned UN3291, whereas UN3373 is not a code used for waste but rather for biological specimens. • Hygiene and sanpro waste are not considered infectious so not classed as dangerous goods • Waste contaminated with suspected or known pathogens with severe risk of infection fall under Category A waste, e.g. Ebola virus. Pathogen should be named • Most infectious waste will fall under Category B Clinical waste is defined as "…any waste which consists wholly or partly of human or animal tissue, blood or other bodily fluids, excretions, drugs or other pharmaceutical products, swabs or dressings, syringes, needles or other sharp instruments, being waste which unless rendered safe may prove hazardous to any person coming into contact with it, and …any other waste arising from medical, nursing, dental, veterinary, pharmaceutical or similar practice, investigation, treatment, care, teaching or research, or the collection of blood for transfusion, being waste which may cause infection to any person coming into contact with it." Under the Controlled Waste Regulations 1992 (issued under the Environmental Protection Act 1990). It is divided into waste with infection risk and medicinal waste. Healthcare waste includes non-infectious and non-hazardous waste (broader than clinical).

Assessment of evidence

Clinical waste definition “is used to describe waste produced from healthcare and similar activities that pose a risk of infection or that may prove hazardous due to their medicinal (chemical) content or their physical nature, for example sharp.”

Both definition of healthcare and clinical waste have “regulatory origins” and are current in regulations. The authors state that it is easier to consider “clinical waste as being a subset of healthcare waste (‘Clinical waste – requires specialist handling and disposal due to hazardous characteristics. Some of this waste is classified as Special Waste.’). It is important that the definitions are not used synonymously.” It is not clear where the quote in brackets is taken from.

Waste documentation, including transfer and consignment notes, should refer to the classifications and terminology used in the EWC.

Unified definitions based on legislation have been compiled “to help waste producers comply with regulatory requirements” and is considered best practice:

- Infectious waste (from definitions provided in Controlled Waste Regulations 1992, Special Waste Amendment (Scotland) Regulations 2004 and WM3 guidance and international carriage by road (ADR)):
    - “healthcare waste that poses a known or potential risk of infection, regardless of the level of infection posed. Even minor infections are included within the definition of infectious”
    - Healthcare waste is waste generated from “healthcare practices” or “by healthcare workers in the community”, and deemed infectious based on clinical assessment of items and patients e.g. municipal waste from small procedures (first aid or self-care are provided as examples) are considered non-infectious unless deemed infectious by a healthcare practitioner
- Offensive or human hygiene waste is defined as “waste which may cause offense to persons coming into contact with it but does not pose a risk of infection”, with examples provided – sanitary waste, nappies, etc
- Definitions for medicinal waste are provided (p.38)

The following waste streams are provided:

- Purple and purple/blue stream for cytotoxic and cytostatic waste: “waste consisting of or contaminated with cytotoxic and cytostatic products and requires incineration in suitably licensed or permitted facilities.”

Assessment of evidence
• Yellow and red stream infectious waste • Orange stream infectious waste: infectious (clinical) waste which requires treatment before final disposal. • Red and red/white amalgam waste: should be labelled if it also contains infectious waste • Blue and blue body medicinal products are described (p.48)

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Environmental Protection Act 1990. 1990 [cited 12 September 2023	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence
This legislation is signposted in SHTN 03-01 as applicable to categorising waste in Scottish health and care settings (see above entry). "An Act to make provision for the improved control of pollution arising from certain industrial and other processes" Section 34 relating to Duty of Care states that: "it shall be the duty of any person who imports, produces, [F1018keeps or manages] controlled waste or, as a broker [F1019or dealer] , has control of such waste, to take all such measures applicable to him in that capacity as are reasonable in the circumstances" "(a) to prevent any contravention by any other person of subsection (2A), (2E), (2F), (2I) or (2K);] (b) to prevent the escape of the waste from his control or that of any other person;" "(c) on the transfer of the waste, to secure— (i) that the transfer is only to an authorised person or to a person for authorised transport purposes; and (ii) that there is transferred such a written description of the waste as will enable other persons to avoid a contravention of

Assessment of evidence
that section [F1026or any condition of a permit granted under regulation 7 of those Regulations]and to comply with the duty under this subsection as respects the escape of waste." "(2A) It shall be the duty of any person who produces, keeps or manages controlled waste, or as a broker or dealer has control of such waste, to take all such measures available to that person as are reasonable in the circumstances to apply the waste hierarchy set out in Article 4(1) of the [F1029Waste Framework Directive]." "(2I) It shall be the duty of any person who transports controlled waste to collect and transport separately from other waste any waste presented— (a) for collection in accordance with subsection (2E) or (2F); (b) for collection in a receptacle provided under an arrangement made in accordance with section 45C(2) or (5)." Regulation 4 contains legislation on transporting waste. This legislation is not specific to health and care settings, but Section 34 is specific to Scotland. SHTN 03-01 waste guidance describes this legislation in relation to waste management in Scottish health and care settings (see above entry). See also the Scottish Government statutory guidance document on the Duty of Care (see above entry).

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Environmental Protection (Duty of Care) (Scotland) Regulations 2014 2014 [cited 12 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence
This legislation is signposted in SHTN 03-01 as applicable to categorising waste in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that “Section 34(1) of the Environmental Protection Act 1990 (“the 1990 Act”) imposes a duty on any person who imports, produces, keeps or manages controlled waste, or who as broker or dealer has control of such waste, to take such measures on the transfer of the waste as are reasonable in the circumstances to secure that there is transferred with the waste such a written description of the waste as will enable other persons to avoid a contravention of any duty under that section or under section 33 of the 1990 Act.” Regulation 3 states that “(1) The transferor and the transferee must ensure that a document as described in paragraphs (3) and (4) is completed in writing and signed by each of them in respect of the waste being transferred (“a transfer note”). (2) A transfer note must be prepared at the same time as the written description is transferred in accordance with section 34(1)(c) of the Act. (3) A transfer note must— (a) give the name and address (including the postcode) of the transferor and the transferee; (b) give the date and place (including the postcode) of the transfer; (c) state whether the transferor is the producer of the waste; (d) state whether the transferor is the importer of the waste; (e) describe the type, composition and quantity of the waste being transferred (including, where the waste is in a container, the type of container); (f) identify the waste being transferred by reference to the appropriate six-digit code in the European Waste Catalogue; and (g) identify the activity carried out by the transferor in respect of the waste being transferred by reference to the SIC code for that activity.” Regulation 4 states that “Regulation 3 does not apply where— (a) the waste transferred is special waste within the meaning of the Special Waste Regulations 1996(13); and

Assessment of evidence
(b) a consignment note (and if appropriate schedule) is completed and dealt with in accordance with those Regulations." Regulation 5 states that "The transferor and the transferee must keep the written description and the transfer note (or copies of them) for a period of two years from the date of transfer of the waste."

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Waste (Scotland) Regulations 2012 2012 [cited 06 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence
This legislation is signposted in SHTN 03-01 as applicable to categorising waste in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that "These Regulations provide for the collection, transport and treatment of dry recyclable waste and food waste, and for related matters." And "They transpose Articles 11(1) (re-use and recycling) and 22 (bio-waste) of Directive 2008/98/EC on waste (OJ L 312, 22.11.2008, p.3) ("the Directive"), and generally make provision connected with the implementation of requirements under European Union waste management legislation." For information on how these Regulations are applicable in Scottish healthcare settings, please see evidence table entry for SHTN 03-01. Further information on how these regulations relate to other waste legislation can be found in the evidence table entry for the Scottish Government guidance for compliance with Duty of Care.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
European Parliament Directive 2008/98/EC of the European Parliament and of the Council 2008 [cited 12 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 as applicable to categorising waste in Scottish health and care settings (see above entry). Otherwise known 'The Waste Framework Directive'. "This Directive lays down measures to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing overall impacts of resource use and improving the efficiency of such use." Article 17 addresses "Control of hazardous waste" i.e. "Member States shall take the necessary action to ensure that the production, collection and transportation of hazardous waste, as well as its storage and treatment, are carried out in conditions providing protection for the environment and human health in order to meet the provisions of Article 13, including action to ensure traceability from production to final destination and control of hazardous waste in order to meet the requirements of Articles 35 and 36."					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 2009 [cited 12 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 as applicable to categorising waste in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that “These Regulations impose requirements and prohibitions in relation to the carriage of dangerous goods by road and by rail and, in so far as they relate to safety advisers, by inland waterway. In doing so they implement certain Directives as respects Great Britain” and “First, the Regulations implement Directive 2008/68/EC of the European Parliament and of the Council of 24th September 2008 on the inland transport of dangerous goods”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
United Nations Economic Commission for Europe. Agreement Concerning the International	Legislation	**Mandatory**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Carriage of Dangerous Goods by Road 2023 [cited 12 December 2023]					

Assessment of evidence

This legislation is signposted in SHTN 03-01 as applicable to categorising waste in Scottish health and care settings (see above entry).

Known as the 'ADR', this international legislation governs transportation of dangerous goods: "According to article 2 of the Agreement, dangerous goods barred from carriage by Annex A shall not be accepted for international transport, while international transport of other dangerous goods shall be authorized subject to compliance with:

- the conditions laid down in Annex A for the goods in question, in particular as regards their packaging and labelling; and
- the conditions laid down in Annex B, in particular as regards the construction, equipment and operation of the vehicle carrying the goods in question."

Chapter 3.2 contains the "Dangerous goods list" (Table A):

- UN No. 2814 – infectious substance affecting humans
- UN No. 2814 – infectious substance affecting humans, in refrigerated liquid nitrogen
- UN No. 2814 – infectious substance affecting humans (animal material only)

Where Annex A provides "General provisions and provisions concerning dangerous substances and articles" including:

- packaging and tank provisions (part 4)
- consignment procedures including marking and labelling (part 5)
- packaging requirements (part 6)

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Controlled Waste Regulations 1992 1992 [cited 08 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence

This legislation is referenced in SHTN 03-01 (see above entry) in relation to the definition of clinical waste.

In the Explanatory Note, it is stated that “Part II of the Environmental Protection Act 1990 (“the 1990 Act”) defines three sorts of controlled waste: household, industrial and commercial waste. The 1990 Act enables regulations to be made whereby waste of any description, including litter and refuse, is to be treated for the purposes of the provisions of Part II as being of one or other of those categories.”

Regulation 1(2) states that ““clinical waste” means—

(a) any waste which consists wholly or partly of human or animal tissue, blood or other body fluids, excretions, drugs or other pharmaceutical products, swabs or dressings, or syringes, needles or other sharp instruments, being waste which unless rendered safe may prove hazardous to any person coming into contact with it; and

(b) any other waste arising from medical, nursing, dental, veterinary, pharmaceutical or similar practice, investigation, treatment, care, teaching or research, or the collection of blood for transfusion, being waste which may cause infection to any person coming into contact with it;”

The Explanatory Note also states that “Regulation 3 prescribes certain types of waste which are not to be treated as household waste”

Regulation 3 states that “Waste of the following descriptions shall not be treated as household waste for the purposes of section 33(2) (treatment, keeping or disposal of household waste within the curtilage of a dwelling)—[…] (c) clinical waste.”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Hazardous Waste (England and Wales) Regulations 2005 2005 [cited 12 December 2023]	Legislation	**Mandatory (in England and Wales)**	N/A	N/A	N/A
Assessment of evidence					
This legislation is referenced in SHTN 03-01 (see above entry) in relation to the definition of hazardous waste. Legislation described as “measures relating to the prevention, reduction and elimination of pollution caused by waste”. In the Explanatory Note, it is stated that “These Regulations set out the regime for the control and tracking of the movement of hazardous waste for the purpose of implementing the Hazardous Waste Directive (Directive 91/689/EC). The Regulations extend to England and Wales although the only provisions that apply to Wales are modifications to the Environmental Protection Act 1990 contained in Part 11.” ““hazardous waste” has the meaning given by regulation 6” Where regulation 6 states that waste is considered hazardous if “listed as a hazardous waste in the List of Wastes” In the Explanatory Note, it is stated that “The Waste Framework Directive (Directive 75/442/EEC) regulates, subject to the certain exclusions, the management of all types of waste (“Directive waste”). The Hazardous Waste Directive supplements the Waste Framework Directive by imposing additional requirements in relation to Directive waste which displays certain hazardous properties. These requirements have previously been transposed by the Special Waste Regulations 1996 through controls on “special waste”. These Regulations repeal the Special Waste Regulations 1996 and replace the term “special waste” with “hazardous waste”.”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The List of Wastes (England) Regulations 2005 2005 [cited 12 December 2023]	Legislation	**Mandatory (England)**	N/A	N/A	N/A
Assessment of evidence					
This legislation is referenced in SHTN 03-01 (see above entry) in relation to the definition of hazardous waste. In the Explanatory Note, it is stated that these regulations implement 2000/532/EC “List of Wastes Decision”, as amended by Decisions 2001/118/EC, 2001/119/EC and 2001/532/EC Note the following: “There are outstanding changes not yet made by the legislation.gov.uk editorial team to The List of Wastes (England) Regulations 2005. Any changes that have already been made by the team appear in the content and are referenced with annotations. (See end of Document for details)”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Special Waste Amendment (Scotland) Regulations 2004 2004 [cited 11 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence
This legislation is referenced in SHTN 03-01 (see above entry) in relation to the definition of special waste and legislation requiring European Waste Catalogue codes to be used in waste management. As amended by the Special Waste Amendment (Scotland) Amendment Regulations 2004 (see below entry). This Amendment to The Special Waste Regulations 1996 includes the following: Regulation 2(3) updated definition of special waste to comply with Hazardous Waste Directive: ""Special waste" means any waste which is hazardous waste as defined by Article 1(4) of the Hazardous Waste Directive F7."." Regulation 2(7) adds a regulation on packaging and labelling special waste: "In the course of its collection, transport and temporary storage, the consignor shall ensure that special waste is properly packaged and labelled in accordance with the relevant provisions of the Carriage of Dangerous Goods (Classification, Packaging and Labelling) and Use of Transportable Pressure Receptacles Regulations 1996 F9."." Regulation 2(8) requiring waste consignment notes to use EWC codes to identify waste: "For paragraph (2)(a) of regulation 5, substitute– "(a) five copies of the consignment note shall be prepared, and, on each copy, Parts A and B shall be completed, and there shall be entered on the consignment note– (i) the relevant code; (ii) the six digit code assigned to the waste in the European Waste Catalogue; and (iii) the postcode of the producer of the waste."." Regulation 2(10) adds a regulation requiring special waste producers to keep a register of waste documents in accordance with the Hazardous Waste Directive: "(1) A 2 producer shall keep a record of the quantity, nature, origin and, where appropriate, the destination, frequency of collection and mode of transport of the special waste produced by that producer. (2) Where special waste is transported from the premises where it was produced, by a person other than the producer of that waste, the requirement on the producer to record the destination of that waste includes a requirement to record particulars sufficient to identify that other person.

Assessment of evidence
(3) A special waste producer shall preserve the records kept pursuant to this Regulation whilst that producer remains the holder of that waste and for at least 3 years commencing on the date upon which that waste is transferred to another person. (4) The information required to be kept in accordance with paragraphs (1) and (2) shall be kept in a register maintained by the special waste producer for that purpose. (5) A special waste producer shall also enter into the register a copy of each consignment note and, where applicable, carrier's schedule in respect of each consignment removedF10.... (6) Except where paragraph (7) applies, the register required to be maintained under paragraph (4) shall be kept at the premises at which the special waste was produced. (7) Where a special waste producer ceases to have access to the premises referred to at paragraph (6), but the period mentioned in paragraph (3) has not expired, for the remainder of that period, that producer shall keep the register at the producer's principal place of business and notify the Scottish Environment Protection Agency thereof forthwith. (8) Any register kept and retained under this regulation shall be produced to, and made available for inspection by, the Scottish Environment Protection Agency on request. (9) Insofar as is consistent with the foregoing provisions of this regulation, registers required to be kept under this regulation may be kept in any form.". Regulation 2(13) amends the consignment form to include the EWC code

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Special Waste Amendment (Scotland) Amendment Regulations 2004 2004 [cited 11 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
These regulations amend the Special Waste Amendment (Scotland) Regulations 2004. The Explanatory Note states that “These Regulations correct an error in the amendment Regulations which requires a producer of special waste to enter into the register details of a producer return in relation to a consignment of special waste”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Landfill (Scotland) Regulations 2003. 2003 [cited 12 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence
This legislation is referenced in SHTN 03-01 (see above entry) in relation to legislation requiring European Waste Catalogue codes to be used in waste management. In the Explanatory Note, it is stated that “These Regulations set out a pollution control regime for landfills for the purpose of implementing Council Directive 99/31/EC on the landfill of waste (“the Landfill Directive”) in Scotland.” Regulation 11 states that “The operator of a landfill shall not accept any of the following types of waste at the landfill– […]any waste in liquid form (including waste waters but excluding sludge); […] any waste in liquid form (including waste waters but excluding sludge);” where ““infectious” if it consists of substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms;”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Environment Agency Hazardous Waste: Segregation and Mixing 2014 [updated 01 October 2020; cited 03 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This UK Government guidance webpage is under the ‘Waste and recycling’ section. This is UK guidance so is not specific to Scottish health and care. There is no information reported on target settings, target users or development process for this guidance. The following detail is provided regarding waste categories: “Categories are defined by differences between wastes, rather than on their List of Waste codes. For example, wastes would be in a different category where their mixing could result in:					

Assessment of evidence
• a chemical reaction between one or more components of each. For example, an acid and an alkali would react, so would be considered to be in different categories even if they have the same List of Waste code, such as 16 05 06* • the identity of one of the wastes being removed, or reduced. For example, where the waste classification and description of the mixed waste does not clearly identify its presence, or its presence was not obvious to carriers or consignees conducting visual duty of care checks • a reduction in hazardous properties of one of the wastes as a result of dilution • a recovery or recycling option no longer being available for one of the wastes • any adverse effect on the disposal or recovery options available for one of the wastes. For example you cannot mix a waste that can either be treated or incinerated with one that can only be incinerated".

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Public Health Agency of Canada Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
2017 [cited 07 September 2023]; Available from:					

Assessment of evidence

This guidance defines biomedical waste.

Canadian Government guidance outlining “routine” and “additional” IPC healthcare practices and modifications to these practices for all healthcare settings. Designed for use by IPC professionals, to develop specific recommendations for local use. Revision from last version. Developed with a working group of varied backgrounds relevant to IPC but methodology isn’t reported. Based on research findings “wherever possible” with consensus by experts in the field filling in the gaps.

Biomedical waste includes “e.g., sponges, dressings or surgical drapes soaked with blood or secretions”.

Biomedical waste is defined as “Waste generated within a healthcare facility that warrants special handling and disposal because it presents a particular risk of disease transmission. Materials shall be considered biomedical waste if

a. they are contaminated with blood or body fluids containing visible blood and

b. when compressed, they release liquid”

The authors signpost to the biomedical waste definition for infectious waste.

As Canadian guidance, definitions originating from legislation may not be relevant to Scottish health and care.

Evidence from previous update(s):

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Special Waste Regulations 1996 1996 [cited 11 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is referenced in SHTN 03-01 (see above entry) in relation to the definition of special waste. As amended by the Special Waste Regulations (Scotland) 2004 (see above entry). In Regulation 1, the following definition is provided: ““consignor”, in relation to a consignment of special waste, means the person who causes that waste to be removed from the premises at which it is being held;” In the Explanatory Note, it is stated that “Regulation 2 defines special waste”. In the Explanatory Note, it is stated that “Regulation 4 requires […] the Scottish Environment Protection Agency (in relation to Scotland) […] to give unique codes to be applied to consignments of waste or to a carrier’s rounds. […] The codes are to be shown, together with other required information, on consignment notes which are to accompany the waste when transported”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Scottish Environmental Protection Agency and Care Inspectorate SEPA Guidance: Management of hygiene waste produced as a result of personal care 2013	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance has been produced in co-operation with the Care Inspectorate and provides guidance on the management and disposal of hygiene waste as a result of personal care.

This guidance defines hygiene waste: "'waste that is produced from human or animal hygiene activities that:

- may cause offence due to the presence of recognisable healthcare waste items or body fluids
- does not meet the definition of an infectious waste
- does not possess any hazardous properties
- is not identified by the producer, or holder, as needing disinfection, or any other treatment, to reduce the number of microorganisms present.'

Assessment of evidence
In general, hygiene waste will include: • sanitary towels and tampons; panty liners; feminine wipes; incontinence products and nappies; catheter and stoma bags; animal faeces and animal bedding etc.”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Sehulster L, Chinn RY; CDC; HICPAC. Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC) MMWR Recomm Rep. 2003;52(RR-10):1-42.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This CDC guidance makes specific recommendations regarding categorising waste in health and care settings. The aim of this document was to provide evidence-based environmental infection control guidance for prevention of “environmentally mediated infections, particularly among health-care workers and immunocompromised patients”. Studies included were outbreak studies (considering “environmental opportunistic microorganisms and epidemiological- or laboratory experimental studies”) and organisational standards and guidelines, supplemented by expert opinion where there was insufficient evidence. Although literature searches were carried out, there was not enough evidence to deduce that methods were systematic, so this guidance was graded as Level 4. The following recommendations are made in relation to categorising waste: The following were identified as categories of medical waste where special handling and disposal is required (Category 2): • “microbiological laboratory waste” • “bulk blood, blood products, blood, and bloody body fluid specimens” • “pathology and anatomy waste” • “sharps” U.S. regulations should be checked to determine any other waste items that should be regulated by law (Category IC) Under the heading “Categories of Medical Waste”, the following is stated: “Precisely defining medical waste on the basis of quantity and type of etiologic agents present is virtually impossible. The most practical approach to medical waste management is to identify wastes that represent a sufficient potential risk of causing infection during handling and disposal and for which some precautions likely are prudent.” Note – in the appendices the authors signpost to an external source on regulated medical wastes in the U.S, where it is stated that (regulated) medical waste is “healthcare waste that that may be contaminated by blood, body fluids or other potentially infectious materials”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Loveday HP, Wilson JA, Pratt RJ, et al. epic3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England. J Hosp Infect. 2014; 86(1):1-70. Doi: https://doi.org/10.1016/S0195-6701(13)60012-2	Guideline	**AGREE II Recommend with Modifications**	N/A	N/A	N/A
Assessment of evidence					
Loveday et al. provide guidelines for preventing hospital infections for healthcare workers in NHS England hospitals. Systematic reviews were carried out for each topic with pre-defined research questions, developed by “a team of specialist infection prevention and control researchers and clinical specialists and a Guideline Development Advisory Group”. This guideline provides a definition for clinical waste in the Glossary, but no supporting citations are provided – “Waste material that consists wholly or partly of human or animal tissue, blood or body fluids, excretions, drugs or other pharmaceutical products, swabs/dressings, syringes, needles or other sharp instruments.” It is not clear how this definition was obtained/compiled.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 2013 [cited 03 October 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence

This legislation defines medical sharps.

In the Explanatory Note, it states that “Regulation 5 concerns the use and disposal of medical sharps – in particular, it provides that the use of medical sharps should be avoided so far as is possible, otherwise that ‘safer sharps’ are used where possible. It prohibits the practice of ‘re-capping’ except where required to control risk and where the risk to the employee is controlled by means of special equipment”. In relation to sharps disposal, Regulation 5 states that “(d) in relation to the safe disposal of medical sharps that are not designed for re-use— (i) written instructions for employees, and (ii) clearly marked and secure containers, are located close to areas where medical sharps are used at work.”

Medical sharp is defined in these regulations as “an object or instrument necessary for the exercise of specific healthcare activities, which is able to cut, prick or cause injury”

Question 3: How and when should waste be segregated in health and care settings?

Evidence added Literature Review V5.0

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Safe management of wastes from health-care activities, 2nd ed. 2014 [cited 15 September]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

The WHO provide specific recommendations for the segregation of waste in health and care settings. Consistent in-text citations are not provided to support this guidance.

This WHO guidance provides guidance on safe handling and disposal of waste from health care globally, also addressing waste management options for developing countries. This second addition of 'The Blue Book' updates guidance from 2007.

This guidance comprises of expert opinion from "internal consultation and collaboration" at a conference in 2007, with peer-review of each chapter from experts worldwide. Names of those who contributed to the first edition are provided in appendix 1.

Target audience: "medical staff, health-care facility directors, ancillary health workers, infection-control officers and waste workers […] regulators, policy-makers, development organizations, voluntary groups, environmental bodies, environmental health practitioners, advisers, researchers and students"

The WHO provide the following guidance on waste segregation:

Assessment of evidence

- "Rigorous segregation" also saves on resource i.e. does not impact waste audits which indicate resource required for proper waste management.
- Waste producers should segregate healthcare waste in the area that it is produced based on disposal route and hazardous potential.
- Proper waste segregation is the waste producer's responsibility as close to point of production as possible.
- If a waste producer is unsure about the category an item of waste falls under then it should be placed in a hazardous waste container.
- As a minimum, hazardous and non-hazardous waste should be segregated. Another safety measure is to further segregate hazardous waste into sharps and "potentially infectious items" into separate containers i.e. a "three-bin system".
- WHO describe their scheme for colour-coded segregation where national legislation is not available (p.79)
- Posters containing information on waste segregation facilitate compliance.
- Improperly segregated waste should not be re-segregated but treated according to the most hazardous waste type in the receptacle.
- Proper segregation is key to safe treatment, handling and disposal of hazardous healthcare waste, minimising the amount of waste that's treated.

The WHO advise that the following points should be covered in training for healthcare workers involved in waste management:

- "Hazardous and general waste should not be mixed. Segregation is the key to safe health-care waste management.
- No attempt should be made to correct waste-segregation mistakes by removing items from a bag or container, or by placing one bag into another of a different colour."

Limitations

- This guidance is from 2014 so some guidelines may be out of date

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Institute for Health and Care Excellence (NICE) and Social Care Institute for Excellence SCIE). Helping to prevent infection A quick guide for managers and staff in care homes n.d. [cited 19 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance supports segregation of sharps and infectious healthcare waste.

This NICE guidance is to be read in conjunction with the Department of Health's code of practice for IPC in care homes. It is based on the NICE guideline on infection prevention and control in primary and community care settings.

The following guidance is provided regarding sharps and waste disposal, but specific supporting references are not provided:

- Sharps should be placed in the correct container at point of production, and sharps containers should be disposed of when they are filled to the fill line.
- Healthcare waste "such as dressings and disposable clothing" can pose infection risk, and so should be segregated "immediately" into colour-coded storage, or bag/container. The authors also state that the reader (note title states target audience are care home

Assessment of evidence
managers and staff) should be aware of how to label and store healthcare waste, but specific guidance is not provided. The authors also state that residents, family and friends should understand how healthcare waste should be handled, stored and disposed of.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health & Social Care Infection prevention and control: resource for adult social care 2022 [cited 20 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This guidance supports segregation of waste by hazard and use of colour-coding. This guidance outlines IPC principles for preventing and managing infections in adult social care, where adult social care covers activities helping the elderly, those living with disabilities or physical/mental illness out-with NHS services, unpaid carers included. This guidance is based off information from NICE, NHS, government departments and other professional regulatory bodies, but Care Quality Commission providers should also comply with those regulations and Code of Practice. Target audience: “those responsible for setting and maintaining standards of IPC within adult social care in England” This guidance states that all waste producers and those involved in waste management should know how to segregate waste “according to hazard”. The authors signpost to the HTM 07-01. The following colour coding system for waste bags in care homes is provided:

Assessment of evidence
• Black for general/household waste • Yellow with black stripe for offensive waste • Orange for infectious waste • Yellow for infectious waste contaminated with medicine/chemicals It is also noted that waste contractors may follow a different colour system **Limitation:** • Please note that Appendix 1 contains links for “further information” including the NIPCM waste review (link broken). Since references are not provided, it is not clear if this was one of the documents which informed this guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare. 2019 [cited 20 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This guidance supports segregation of waste at source, but no in text citations are provided to support this as relevant legislation is signposted. These Australian guidelines are nationally accepted for IPC “core principles and priority areas for action” with the intent to guide development of protocols and processes. The intended audience is healthcare workers and healthcare facilities. The guidance is “underpinned by a risk-management framework to ensure the basic principles of infection prevention and control can be applied to a wide range of healthcare settings including hospitals, day procedure units, office-based practice, long-term care facilities, remote area health services, home and community nursing and emergency services”. Risk assessments should guide application at facility level. The evidence base mainly surrounded high risk and acute settings. Although waste management is addressed in this guidance, legislation underpinning recommendations is from Australian Commonwealth is cited, so this guidance may not be specific to Scottish health and care settings. The following guidance is provided in the context of handling waste: “segregation should occur at the point of generation” AS 3816:2018 standards for management of clinical and related wastes and a code of practice on the Management of Clinical and Related Wastes were referenced, but could not be accessed in full.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Infection prevention and control guideline for Ebola and Marburg disease 2023 [cited 10 November 2023]	Guideline	**AGREE II Recommend with Modifications**	N/A	N/A	N/A

Assessment of evidence

This guideline describes considerations relevant to segregating HCID waste.

Guideline “provides IPC recommendations for Ebola and Marburg disease outbreaks” with a healthcare focus and wider consideration of community settings. These recommendations should be followed during readiness or response activities. Core and development team members and affiliations are listed, including methodology experts. New evidence should result in updates (no timeline provided). Previous update recommendations have been incorporated alongside new evidence and a distinction made where appropriate. Intended audience: “policy-makers, health-care administrators and managers, IPC specialists, logisticians, community workers, burial teams and all health and care workers.”

Methods: a “guideline development group” made of diverse backgrounds and an “external peer-review group” were involved in the review and consultation process. GRADE was used to appraise appropriate evidence. Systematic reviews from previous updates were summarised and their recommendations incorporated where appropriate. This 2023 update involved a series of studies: systematic review, rapid reviews, scoping review and mixed methods study. The systematic review was used for an AGREE II appraisal and graded AGREE Recommend with Modifications, based on ARHAI criteria.

The following is stated regarding implementation considerations for managing Ebola/Marburg-associated waste: “Waste should be segregated at the point of generation to enable appropriate and safe handling.”

Limitations

- These are global recommendations and will be applicable to Scottish health and care settings if there were an outbreak of Ebola virus or Marburg disease.
- Poor distinction between methodologies and findings of each development process different studies carried out.
- Poor reporting of search strategies, time ranges and inclusion/exclusion criteria.
- Poor description of populations likely influenced by the content of these guidelines.
- No statement of influence of funding bodies.
- Tools are yet to be published.

Assessment of evidence
• Timeline and methods for update are not provided.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Standards New Zealand. Management of Healthcare Waste. 2002 [cited 22 September 2023]	Standard	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This standard advises segregation of waste by stream at source, and ensuring segregation through the waste management cycle. This New Zealand standard contains best practice guidance (beyond legislative requirements) on human and animal healthcare waste disposal including classification, segregation, packaging/containment, labelling, storage and transport, where healthcare waste refers to all waste produced by a healthcare facility. These standards aim to assist compliance with regulations and best practice in healthcare waste management. Benefits of waste minimisation and proper segregation are highlighted. Segregation is described as separating waste by category at point of production (i.e. “separation at source”). This segregation should continue through handling, storage and transport. A waste stream governs the way in which the waste to which it is assigned will be managed.					

Assessment of evidence
Waste should be appropriately segregated according to the category in which it fits i.e. hazardous (sharps or non-sharps and relevant subcategories), controlled or non-hazardous (see ET2 entry for breakdown). Waste should be segregated at source before being packaged. **Limitations** • From 2002 so may not be reflective of current best practice • How best practice determined not clear

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Government of Canada. Infection prevention and control measures for Ebola disease in acute care settings. 2023 [cited 07 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This guidance addresses sharps segregation in the context of Ebola patient treatment in acute care. Aim: “guidance on the minimum level of IPC measures in healthcare settings in the event that a person under investigation for EBOD or patient with EVOD is identified within a Canadian healthcare facility”					

Assessment of evidence
Appendix C in this Governmental guidance covers management of waste associated with suspected and confirmed cases of Ebola. Guidance is relevant to “facility and medical” waste management personnel, IPC, occupational health and safety and HCW educators and “environmental services personnel” who may manage Ebola-associated waste in Canada. Evidence used for development is stated as “currently available scientific evidence, standards and regulations” with consideration of gaps or inconclusive research where appropriate. This guidance should be updated in line with emerging evidence. This document does not include care and management of the deceased. This guidance advises that sharps waste should be segregated at the point of production. **Limitations** • A dedicated reference list for Appendix C is not provided and in-text citations are not used so it is unclear how evidence informed above guidance. • Reference list mainly contains guidance and other grey literature specific to Canadian healthcare settings, so the guidance did not consider primary literature. • This guidance presents minimum infection prevention and control measures for acute Canadian healthcare facilities. The authors state that these guidelines were developed based on Canadian settings so applicability to Scottish settings may be limited. • Much of the references are CDC and WHO but in text citations are not used so it is not clear where CDC/WHO citations has contribute to this guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England. Health Technical Memorandum 07-01: Safe and sustainable	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
management of healthcare waste 2022 [cited 23 October 2023]					

Assessment of evidence

HTM 07-01 provides guidance for segregation of waste in health and care settings as per legislative requirements.

Health technical memoranda are described as “comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology” for healthcare delivery. This guidance targets safe and sustainable management of healthcare waste for all NHS Trusts, and laboratories and vet surgeries.

it is stated that this best practice guidance is not mandatory unless stated. Where authors have used this wording is indicated in the ETs by “”s. The authors provide the following guidance on these choices of wording:

- “must” for legal compliance
- “should” for a recommendation that is not mandatory
- “may” for permission

This guidance replaces the 2013 version, with the aim of supporting compliance with legislative changes and better capturing sustainability goals including the NHS Clinical Waste Strategy.

A list of contributors is provided, and a statement thanking those from the “scoping and technical engagement phases” indicating a consultation phase but not much detail is provided on how this guidance was formed, including no indication of systematic methods.

Target audience: those involved in NHS waste management (details on relevant sections by job role are signposted in Table 1, p.4), targeted towards compliance with English legislation and regulations so should not be “relied upon” by devolved nations.

Assessment of evidence

Accurate segregation is key to meeting NHS Clinical Waste Strategy targets – when waste is incorrectly segregated, it can cause injury or ill health or environmental damage. Where waste is incorrectly segregated into more hazardous categories (over-classification) is also problematic for sustainability and cost-cutting purposes.

Figure 12 outlines segregation and colour-coding according to this English guidance, demonstrating the relationship between waste types (hazardous, non-hazardous, clinical and dental wastes). To classify and segregate waste, the authors state that hazardous properties (infectious, cytotoxic/cytostatic and/or chemical/medicinal) should be determined.

“The colour-coded waste classification system outlined in this section identifies and segregates waste on the basis of waste type, hazard and suitability of treatment/disposal options in line with the approach [summarised in paragraphs 5.24–5.61] regarding classification and segregation of waste.” (p.51)

To comply with English legislation, the following guidance is provided for handling clinical waste:

- Always segregate waste properly i.e. sharps into sharps bins

The following segregation guidance is provided for compliance with English legislation:

- EWC codes correspond to waste streams “defined” by waste items placed in a receptacle rather than the type of receptacle
- staff “must” be sufficiently trained on segregation
- Figure 13 provides segregation guidance (see Appendix 13 and WM3 also)
- If waste is not clinical, it will still be hazardous if it contains radioactive material, amalgam, x-ray fixer or developer or electrics
- The NHS England colour-coded segregation system is described, but not entered into this evidence table as the authors state that the system adopted in NHSScotland is different (see ET entries for SHTN 3)
- Regular training and written and visual reminders, colour-coded and labelled receptacles facilitate correct segregation

Waste management requirements for dental settings are described – they “must” comply with the same legislation as other healthcare facilities.

Assessment of evidence
Chapter 6 describes “key principles associated with key management functions”, wherein organisation-specific waste management policy is described. As such, all healthcare staff involved in waste management should take responsibility for waste produced from point of production to final disposal. Good waste management is key for accurate segregation, consignment and final disposal. Community healthcare (including home care and residential care homes): • Classification of waste as infectious or not should consider patient history and infection risk (e.g. clinical symptoms indicating infection) and be made at point of waste production. This classification decision can change dependent on more patient information becoming available (see Table 21 for “generic assessment” criteria) Proper segregation and classification of waste still applies in primary care. Table 22 outlines best practice examples, and much of Appendix 2 guidance applies. Ambulatory services should follow community healthcare guidance for classifying, transporting and disposing of waste. Hazardous and non-hazardous waste “must” be segregated to comply with the law. Waste producers, importers, keepers, storers, transporters and those treating and disposing of waste “must take all reasonable steps to ensure that waste is managed properly from the point of production to the point of final disposal”. The authors signpost to Defra’s duty of care guidance, but it is not clear if this is applicable in Scotland. **Limitations** • The Welsh HTM 07-01 is based on the old 2013 HTM 07-01. However, this current version is also linked out in NHS Wales web pages, so it is not clear if Welsh NHS boards are also to follow this guidance. • Unclear methodology and inconsistent in text citations used.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland Waste Management Guidance: Scottish Health Technical Note 03-01. Version 7.0. 2023 [updated 09 December 2024; cited 02 November 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This document provides guidance for segregation of waste in health and care settings in Scotland, supporting compliance with legislation. Specific waste streams and corresponding colour-coding are described.

This guidance aims to help boards in NHSScotland meet waste management legal, policy, procedural requirements and best practice in Scotland, applicable to NHSScotland healthcare services producing waste, superseding the SHTN 03-01 Parts A to D. It is stated that NHSScotland staff and contractors should not rely on the HTM 07-01 or UK-wide waste management guidance alone due to differing legal requirements across the UK.

Target audience: “staff and contractors involved at all stages of waste management in the modern healthcare setting”

Written by the NHSScotland Waste Management Steering Group. Member names and job titles are not provided.

Endorsed by SEPA.

Assessment of evidence

A disclaimer is provided stating that the guidance is “general” and accurate at time of publication.
 	
Training and audit requirements are also described in chapters 14 and 15 respectively but are out-with the remit of this review.
 	
Duty of care:
 	
• Waste producer’s responsibilities are described:
  ○ Minimum source segregation and “presentation of the waste glass, metal, plastic, paper and card (including cardboard)
  ○ “taking care of the waste while you hold it, so it does not escape from your control”
 	
The Special Waste Regulations 1996 (as amended) “define and regulate the segregation and movement of special waste in Scotland from the point of production to the final point of disposal or recovery. These Regulations, among other things, require producers of special (hazardous) waste to complete consignment notes restricts the mixing of special/hazardous wastes (unless authorised in a licence/ permit”. The authors signpost to SEPA guidance on consigning special waste
 	
If infectious waste is not properly segregated from non-infectious waste, then the entire waste stream should be classed as infectious waste (special waste) and “consigned for appropriate treatment and recovery or disposal”.
 	
Under the heading of “Segregation of cytotoxic and cytostatic medicinal wastes”, it is stated that “The Special Waste Regulations 1996 (as amended) prohibits the mixing of hazardous and non-hazardous wastes so the correct identification and segregation (at source), is vital to ensure this does not occur”.
 	
Waste should be segregated “at the point of production into a suitable colour-coded and suitably labelled packaging”. It is a legislative requirement under health and safety, Carriage and waste regulations that waste is “described, handled, transported and disposed of in a safe and effective manner”.
 	
Colour coding is best practice in NHSScotland and supports minimum compliance with regulations:
 	
“identifies and segregates waste on the basis of waste classification and suitability of treatment/disposal options”. Figure 3.2 provides “colour-coding segregation for primary waste receptacles” (p.43). This colour-coding system is described as mandatory, “agreed with the

Assessment of evidence
current waste contractor" and SEPA (the regulator). It supports identification and treatment of waste throughout its' life cycle (described as "cradle to grave"). A colour coding segregation system for source segregated recyclates is also provided (p.46). The following waste streams are provided: • Purple and purple/blue stream for cytotoxic and cytostatic waste: "waste consisting of or contaminated with cytotoxic and cytostatic products and requires incineration in suitably licensed or permitted facilities. Healthcare facilities that produce this waste stream need to ensure that suitable purple receptacles are available for this waste stream. […] subject to the controls of the Special Waste Regulations" • Yellow and red stream infectious waste: yellow stream is for "waste known or suspected to contain pathogens classified in Category B (UN3291) as specified in the Carriage Regulations. Yellow stream infectious waste requires disposal by incineration in a suitably licensed or permitted facility. This waste stream includes anatomical waste (yellow and red) and may include other types of waste that require incineration to comply with national or regional policy". The authors discuss protocol for classifying waste if an autoclave were to break down of autoclave occurs. "Yellow stream infectious waste is special (hazardous) waste and is subject to the controls of the Special Waste Regulations." • Orange stream infectious waste: infectious (clinical) waste which requires treatment before final disposal. Contains known/suspected pathogens classed as Category B (UN3291) under the Carriage Regulations. Hazardous waste, controlled by the Special Waste Regulations. "under the Landfill Regulations, it is prohibited to send infectious waste direct to landfill for disposal." • Red and red/white amalgam waste: should be labelled if it also contains infectious waste • Blue and blue body medicinal products are described (p.48) "Specific" waste stream segregation: • Radioactive waste should be incinerated at licensed facilities, and will have "over-stickers' on yellow packaging"

Assessment of evidence
• Liquid and solidified liquid waste “should be placed in a rigid leak-proof receptacle for disposal”. Waste treatment facilities may require that liquid waste is solidified • Sharps waste: sharps bins should not be disposed of in other waste streams. If they are contaminated with medicinal products, they should be disposed of in purple/yellow (cyto contamination) or blue/yellow (non-cyto contamination) • Category A infectious waste: classed as UN3549 under the ADR, should be treated on site before uplift. • Amalgam • Fixer and developer • Large equipment • Implanted devices • Hygiene waste Systems to promote “successful” segregation of waste are described, including rationale, “appropriate equipment”, training, audit and collection frequency. Waste storage should be large enough to facilitate waste segregation. Incidents of “inappropriate” segregation should be investigated.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009. 2009 [cited 12 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 as applicable to waste segregation in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that “These Regulations impose requirements and prohibitions in relation to the carriage of dangerous goods by road and by rail and, in so far as they relate to safety advisers, by inland waterway. In doing so they implement certain Directives as respects Great Britain” and “First, the Regulations implement Directive 2008/68/EC of the European Parliament and of the Council of 24th September 2008 on the inland transport of dangerous goods”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Landfill (Scotland) Regulations 2003 2003 [cited 12 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence
This legislation is signposted in SHTN 03-01 as applicable to waste segregation in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that “These Regulations set out a pollution control regime for landfills for the purpose of implementing Council Directive 99/31/EC on the landfill of waste (“the Landfill Directive”) in Scotland.” Regulation 11 states that “The operator of a landfill shall not accept any of the following types of waste at the landfill– […]any waste in liquid form (including waste waters but excluding sludge); […] any waste in liquid form (including waste waters but excluding sludge);” where ““infectious” if it consists of substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms;”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste. 1999. Accessed 12 December 2023.		**Level**			

Assessment of evidence
This legislation is signposted in SHTN 03-01 as applicable to waste segregation in Scottish health and care settings (see above entry). Article 1 describes the objective of the directive: “the aim of this Directive is, by way of stringent operational and technical requirements on the waste and landfills, to provide for measures, procedures and guidance to prevent or reduce as far as possible negative effects on the environment, in particular the pollution of surface water, groundwater, soil and air, and on the global environment, including the greenhouse effect, as well as any resulting risk to human health, from landfilling of waste, during the whole life-cycle of the landfill.”

Assessment of evidence
Article 5 on “waste and treatment not acceptable in landfills” states that “Member States shall take measures in order that the following wastes are not accepted in a landfill: (a) liquid waste; […] (c) hospital and other clinical wastes arising from medical or veterinary establishments, which are infectious as defined (property H9 in Annex III) by Directive 91/689/EEC and waste falling within category 14 (Annex I.A) of that Directive.”

Evidence from previous update(s):

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Special Waste Regulations 1996. 1996 [cited 11 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 as applicable to waste segregation in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that “Regulation 17 prohibits the mixing of special waste with other waste or other categories of special waste except where this is authorised under, or exempted from the effect of, certain other waste management legislation”. Regulation 17 states “(1) Subject to paragraph (2), an establishment or undertaking which carries out the disposal or recovery of special waste, or which collects or transports special waste, shall not— (a) mix different categories of special waste; or (b) mix special waste with waste which is not special waste.”					

Assessment of evidence
Please refer to ET entries for the SHTN 03-01 for how the Special Waste Regulations (1996) should be applied with regard to waste management in Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Sunley K, Gallagher R, Reidy MP, et al. Essential Practice for Infection Prevention and Control - Guidance for nursing staff. London: Royal College of Nursing, 2017	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This RCN guidance supports colour-coding of waste to support segregation. This document produced by the Royal College of Nursing is practice guidance based on evidence-based consensus to influence care decisions, with a focus on good infection prevention and control practices. Under “Safe handling and disposal of waste”: Waste disposal and segregation and relevant education/training should be encapsulated in local policy, including colour-coding of waste e.g. black bags for domestic waste, tiger striped bags for offensive waste and orange bags for infectious waste.					

Assessment of evidence
Limitations • This document was due to be updated in November 2020 but has not been

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health and Health Protection Agency. Prevention and control of infection in care homes – an information resource. 2013 [cited 03 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This UK guidance supports colour-coding of waste to support segregation. Best practice infection prevention and control guidance for staff caring for residents in care homes in England and should be read in conjunction with "The Health and Social Care Act 2008: Code of Practice on the prevention and control of infections and related guidance". The authors state that not all of the guidance will be applicable to all care homes. Target audience: "Care Trust CEs, GPs, Communications Leads, Consultants in Communicable Disease Control, Community Infection Control Nurses, Health Protection Nurses, Care Home Managers, Care Quality Commission" Under Part 3 that addresses "Basic infection prevention and control practices" i.e. Protocols that should be applied by all care workers at all times to reduce likelihood of infection:

Assessment of evidence
• Waste management guidance provided aims to facilitate adherence with English legislation (Hazardous Waste (England and Wales) Regulations 2005, as amended by the Hazardous Waste (England and Wales) Amendment Regulations 2009, and the Lists of Waste Regulations 2005 “(which introduce the European Waste Catalogue Codes)”), under which any infectious or hazardous waste is classed as hazardous • “The person in charge” is responsible for management of clinical and hazardous waste i.e. ensuring correct classification, containment, labelling/tagging and secure storage before final treatment • Clinical waste should be “secured in an approved way and identified with a coded tie or label to indicate source of waste”, with Table 5 containing the colour coding segregation scheme by infection risk • To avoid cross-contamination, clinical and hazardous waste should remain segregated in storage from general waste and soiled laundry. **Limitations** • For waste management, the bibliography references the DoH Safe management of healthcare waste guidance which is now archived

Question 4: Are there specific standards for different waste receptacles in health and care settings?

Evidence added to Literature Review V5.0

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health. Health Building Note 00-09: Infection control in the built environment. 2013 [cited 28 August 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance details requirements for waste receptacles in health and care settings. Specific recommendations are made regarding receptacle design.

This Health Building Note aims to address IPC issues and risks to address during project design and construction. This guidance can be applied to all healthcare facilities, but does not extend to operational IPC management like outbreaks or standard precautions.

It is intended to be cross referenced with the Health and Social Care Act 2008: Code of Practice

Target audience: “all providers of NHS care”; “NHS Trust CEs, Care Trust CEs, Foundation Trust CEs, Medical Directors, Directors of PH, Directors of Nursing, Allied Health Professionals, Communications Leads, Emergency Care Leads”

The authors highlight that to encourage “desired behaviour”, the following should be considered in healthcare facility design:

Assessment of evidence

- Segregation and management of waste
- Domestic waste receptacles
- Bedside waste disposal

Clinical wash-hand basins should have “hands-free waste bins” containing colour-coded waste bags next to each wash-hand basin for hand drying.

Waste receptacles should be placed close to point of production “to avoid unnecessary handling of waste”, and there should be sufficient space for segregation at ward/unit level (see HTM 07-01)

Waste receptacle size should reflect quantity of waste by stream of waste

Waste receptacles should be easy to clean and hands-free (foot-operated)

Waste receptacle lids should not be labelled as this may inhibit cleaning/disinfection

Specific recommendations made include:

- Design should allow for enough space for hands-free waste bins close to hand-wash basins
- Waste receptacles should be easy to clean and hands-free (foot-operated)
- Waste receptacle lids should be easily cleaned/disinfected

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England NHS Estates. HBN 26 Facilities for surgical procedures.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
2004 [cited 29 August 2023]					
Assessment of evidence					
This health building note details requirements for waste receptacles in surgical settings. This Health Building Note provides guidance for facilities for surgical procedures in healthcare settings, based on a department containing eight operating theatres with their own aesthetic and preparation rooms and recovery unit. Target audience: “project and design teams; estates directors and their staff; PFI consortia and private-sector contractors; executive directions and senior managers of acute trusts; Infection Control teams; clinicians from every profession working in operating departments, or in partnership with, surgical care teams; NHS Foundation Trusts” Operating and surgical departments produce a large volume of clinical waste In scrub and gowning rooms, foot-operated bins should be available for disposal of brushes and waste paper. In flexible endoscope cleaning room and stores, “pedal-operated sack-stands” should be available next to clinical hand-wash facilities.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
European Centre for Disease Prevention and Control (ECDC). Safe use of personal protective equipment in the treatment of infectious diseases of high	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
consequence: A tutorial for trainers in healthcare settings. 2014 [updated 03 December 2014; cited 29 August 2014]					

Assessment of evidence

This guidance details requirements for waste bags and containers for HCID waste.

This ECDC tutorial aims to contribute to better hospital preparedness in Europe by addressing technical requirements for PPE for HCID, critical aspects of these ensembles, protection beyond PPE and occupational safety and health. This document was developed by ECDC and external experts, addressing documents on PPE for Ebola patient care (from international and European organisations) and guidelines and training materials from the WHO, US CDC and Medicins sans Frontieres.

Target audience: Mainly “future PPE instructors with a background in infection control and hygiene in hospital settings” and “professionals in communicable diseases, infection control and hospital hygiene experts, hospital managers in charge of administration, nursing, OSH and emergency planning [; …] experts in preparedness at the regional and national levels”

Table 1 states that waste management material includes “Big, mechanically resistant and leak-proof waste bag; Leak-proof and autoclavable containers with clip on – non removable lids” and “Container for sharp, pointed objects (e.g. needles, syringes, glass articles, tubing etc”. Pictures are provided.

Under “Considerations on barrier management”, the authors state:

- “Infected materials should be put in impermeable bags or hard plastic containers. These bags and containers need to be clearly labelled as highly infectious waste.”

Assessment of evidence
• Sharp and point objects like open vials and needles should be put in “hard plastic containers” and clearly labelled **Limitations** • Described as a living document but no updates past 2014 recorded

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Büchner F, Hoffman M, Dobermann UH, Edel B, Lehmann T, Kipp F. Do closed waste containers lead to less air contamination than opened? A clinical case study at Jena University Hospital, Germany. Waste Manag. 2021;136:11-17.	Observational air sampling study	**Level 3**	Investigating the effect of type of non-infectious waste container on ambient air contamination	Type of non-infectious waste container: • Open (50L Tork 563000, Essity Professional Hygiene Germany) • Closed (70L Abfallsammler MS1655L, Hammerlit GmbH, Germany) • Hands-free opening mechanism	Bacterial and fungal air contamination of waste container and reference point (>1m distance from waste container)

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
				(70L Abfallsammler Clappy MS71, Hammerlit GmbH)	

Assessment of evidence

The findings of this study indicate that in the specific wards sampled, ambient air of non-infectious waste containers exhibited bacterial and fungal contamination, as well as samples taken from approximately 1m away. Further, fungal counts in open containers for non-infectious wastes were significantly higher than for closed and hands-free mechanism containers, but still remained low.

This clinical air sampling study investigated microbial ambient air contamination of different types of non-infectious waste containers in patient rooms, sanitary units, clean work rooms and soiled utility rooms in surgical, diabetic and ICU wards in a German hospital.

Methods:

Samples were obtained using a VWR Microbiological Air Sampler SAS Super ISO 100, Italy placed directly above the opening of the container with reference samples taken 1 metre from the waste container in the same room and at the same height with 500L (100l/min) collected per sampling across five “sampling cycles” between September and October 2017. Samples taken 8, 24 and 48 hours after waste bags being replaced. Handsfree and closed containers were opened and closed once every 60s during sampling to simulate the opening and closing of bins during use. Samples were not taken from patient bins where the patient had a confirmed or suspected infectious disease.

294 samples were taken from open containers, 100 from closed and 380 from the hands-free containers. 5.6% of samples could not be taken as cleaning staff removed waste bags earlier than instructed. Room dimensions, temperature and relative humidity of sampling sites are provided in the supplementary material.

Findings:

Bacteria were found in all samples (n=387, 100%), while fungi were reported in only 207 of samples (53.5%).

Assessment of evidence

Qualitative analysis reported identification of Coagulase-negative *Staphylococci, Micrococci, Bacillus spp*. and *Streptococcus spp.* as the most observed bacteria, and *Aspergillus fumigatus* and *Rhizopus sp*. as the most observed fungi.

There were no significant differences in viable counts of bacteria between container types. However, fungal counts were significantly higher ($p<.05$) in open containers (mean=2.32CFU/m^3, standard error = 0.155, n=147) compared with closed (mean=2.08CFU/m^3, standard error - 0.236, n=64) and hands-free containers (mean =1.97CFU/m^3, standard error =0.177, n=195). Although counts for samples taken from waste container openings were slightly higher, there was no significant difference in air contamination for bacteria or fungi when comparing counts to reference samples, >1m distance from the containers ($p>.05$).

Limitations

- Open waste container with smaller volume (50L vs 70L)
- No audit data reported for compliance to correct waste segregation
- Non-infectious waste container described as containing waste like dressings, casts, linen, disposable clothes and nappies
- Not all types of containers were sampled in the specified room of each ward, and closed containers were not sampled at all in the internal medicine ward
- Do not report sub-analysis of difference between contamination at 8/24/48 hour intervals despite supplementary material indicating increasing contamination in some settings with time
- Do not report Ct values or infectivity of air samples

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Control and Prevention. Procedures for Safe Handling and Management of Ebola-Associated Waste. 2022 [cited 08 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance details requirements for receptacles for managing EVD and MVD waste in US health and care settings.

This CDC guidance aims to provide detailed protocols to be read in conjunction with the CDC guidance on “Ebola-Associated Waste Management”. It is stated that this guidance is applicable to Ebola Disease and Marburg Virus Disease, and the page is currently being reviewed so the terminology used is true to this.

Target audience: “Hospital infection control, occupational health systems, and facility medical waste managers and personnel”

Under “Supplies for Hand Hygiene, Cleaning and Disinfection, and Packaging Waste”:

A list of equipment is provided:

- “Leak-proof labelled biohazard bags” where the film of the bags is minimum 1.5mils (0.0015 inches) thick with a capacity of 175l
- Sharps containers should be approved according to NIOSH standards (links out to pre-2000 document on selecting sharps disposal containers)

Assessment of evidence
• "Rigid outer receptacle that conforms to U.S. DOT HMR requirements for transport of Category A DOT waste provided by approved waste vendor" i.e. the outer packaging should be rigid, meeting UN standards or DOT-approved. Fiberboard outer packaging should have a triple wall containing 6mil polyethylene liner; "waste should be packaged with an installed liner provided by the waste vendor" and there should be absorbent material to capture any free fluid placed at the bottom of the outer packaging or in the liner of fiberboard packaging.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Control and Prevention. Interim Guidance for Environmental Infection Control in Hospitals for Ebola Virus. 2022 [cited 08 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This guidance details requirements for waste receptacles for EVD and MVD waste in US health and care settings. This CDC guidance is intended to assist healthcare workers in following IPC recommendations when caring for patients with suspected/confirmed Ebola. It is stated that this guidance is applicable to Ebola Disease and Marburg Virus Disease, and the page is currently being reviewed so the terminology used is true to this.

Assessment of evidence
Target audience: healthcare workers in hospitals, most relevant to those caring for patients with suspected or confirmed Ebola. Waste receptacles for PPE, cloths, linens etc should be leakproof and rigid.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Safe management of wastes from health-care activities, 2nd ed. 2014 [cited 15 September]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
The WHO provide specific requirements for waste bags, receptacles and sharps containers to be used in health and care settings, including signposting to relevant standards. This WHO guidance provides guidance on safe handling and disposal of waste from health care globally, also addressing waste management options for developing countries. This second addition of 'The Blue Book' updates guidance from 2007. This guidance comprises of expert opinion from "internal consultation and collaboration" at a conference in 2007, with peer-review of each chapter from experts worldwide. Names of those who contributed to the first edition are provided in appendix 1. Target audience: "medical staff, health-care facility directors, ancillary health workers, infection-control officers and waste workers […] regulators, policy-makers, development organizations, voluntary groups, environmental bodies, environmental health practitioners, advisers, researchers and students"					

Assessment of evidence
Waste receptacles are described as bags, bins and sharps containers. Specifications for waste containers are provided, including the following: • All containers should be “sturdy and leak-proof”. All containers except for sharps should be lined with a “sturdy plastic bag” with recommended thickness of 70um (see ISO 7765 2004) and free from chlorine. • Lids for containers should be “well-fitting”, and “removable by hand or preferably operated by a foot pedal”. The colour of the waste container and bag should reflect the type of waste the receptacle is intended for and labelled accordingly. Colour mixing has potential to encourage improper segregation. • Sharps containers should be “puncture-proof and impermeable”, and difficult to re-open after being sealed. The authors cite WHO (2007) performance specifications. Sharps containers can be “disposable or designed for disinfection and reuse” – reusable containers are plastic or metal and single-use tend to be plastic cardboard or plastic. Options for low resource settings are provided. • Containers should be large enough for the amount of waste produced in that clinical area, informed by waste audit data • Waste receptacles should be regularly cleaned. **Limitations** • This guidance is from 2014 so some guidelines may be out of date.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Gallagher R, Cameron L and Sunley K. Sharps safety. RCN guidance for the prevention and management of sharps injuries in health and social care settings 2023 [cited 19 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance summaries relevant legislation for disposing of sharps in UK health and care settings, and signposts to relevant British Standards for sharps containers and requirements for these.

The RCN is a UK union and professional body for nursing. This guidance document was made in association with “The RCN UK Safety Representatives’ Committee Rose Gallagher, RCN Professional Lead for Infection Prevention and Control, Leona Cameron, RCN Head of Health, Safety and Wellbeing, Kim Sunley, Health, Safety and Wellbeing National Officer.” The guidance is “intended for use in the UK” but can be extrapolated for other countries where appropriate. Information is said to be “compiled from professional sources, but its accuracy is not guaranteed.”.

Regulations summarised in this document:

- Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 and the Health and Safety (Sharp Instruments in Healthcare) Regulations (Northern Ireland) 2013.

Assessment of evidence

- Control of Substances Hazardous to Health Regulations 2002 (COSHH) / Control of Substances Hazardous to Health (Northern Ireland) 2003.
- Management of Health and Safety at Work Regulations 1999/Management of Health and Safety at Work (Northern Ireland) Regulations 2000.
- The Provision and Use of Work Equipment Regulations 1998 and the Provision and Use of Work Equipment (Northern Ireland).
- Reporting of Diseases Injuries and Dangerous Occurrences Regulations 2013 (RIDDOR)/The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (Northern Ireland) 1997.
- The Personal Protective Equipment at Work (Amendment) Regulations 2022 and the Personal Protective Equipment at Work Regulations (Northern Ireland) 1993.
- Health and Safety (First Aid) Regulations 1981 and The Health and Safety (First-Aid) Regulations (Northern Ireland) 1982.
- Safety Representatives and Safety Committee Regulations. 1977 and the Safety Representatives and Safety Committee (Northern Ireland) Regulations 1979.

For “Engineering controls” for sharps safety, the following is provided as an example to limit hazards: “adequate numbers of easily accessible sharps disposal containers”.

Reusable sharps containers (example provided includes “Safety engineered sharps containers that eliminate overfilling, have temporary and permanent closures, restrict hand access and comply with BS EN ISO 23907-2:2019.”):

- The regulations summary table mentions BS EN ISO 23907-2:2019: “If procuring reusable sharps containers, employers should procure containers that complete with the minimum standard ISO 23907-2 which specifies requirements for reusable sharps containers intended to hold potentially hazardous sharps medical waste with or without sharps protection features and also specifies requirements for lifespan simulation, cleaning & decontamination, microbial validation, quality monitoring and performance testing.”
- Above section also states that safety representatives should be consulted for container selection.

Assessment of evidence
Single-use sharps containers: • The regulations summary table mentions BS EN ISO 23907-1:2019: “If procuring single use sharps containers, employers should procure containers that comply with the minimum standard ISO 23907-1 which specifies requirements for single-use sharps containers intended to hold potentially hazardous sharps medical waste with or without sharps protection features, e.g. scalpel blades, trocars, hypodermic needles and syringes.” • Above section also states that safety representatives should be consulted for container section. For those requiring pre-assembly, signing and dating of the label is required to confirm assembly has been carried out. Work practice controls for sharps safety: “placing sharps containers at eye level and within arm’s reach.” References provided at the end of the document, alongside other resources. **Limitations** • No methodology or development process is reported nor are member names and affiliations involved in development of these guidelines. • No strength of recommendations provided based on available evidence. • Unclear whether evidence has been graded for use in these guidelines.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health & Social Care. Infection prevention and control: resource for adult social care 2022 [cited 20 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance provides IPC requirements for bins used in adult social care.

This guidance outlines IPC principles for preventing and managing infections in adult social care, where adult social care covers activities helping the elderly, those living with disabilities or physical/mental illness out-with NHS services, unpaid carers included. This guidance is based off information from NICE, NHS, government departments and other professional regulatory bodies, but Care Quality Commission providers should also comply with those regulations and Code of Practice.

Target audience: “those responsible for setting and maintaining standards of IPC within adult social care in England”

Bins should have lids which are foot operated and be lined with disposable plastic waste bags.

Limitation

- Please note that Appendix 1 contains links for “further information” including the NIPCM waste review (link broken). Since references are not provided, it is not clear if this was one of the documents which informed this guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare 2019 [cited 20 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance signposts to Australian standards by which sharps containers which sharps containers should comply with.

These Australian guidelines are nationally accepted for IPC “core principles and priority areas for action” with the intent to guide development of protocols and processes. The intended audience is healthcare workers and healthcare facilities. The guidance is “underpinned by a risk-management framework to ensure the basic principles of infection prevention and control can be applied to a wide range of healthcare settings including hospitals, day procedure units, office-based practice, long-term care facilities, remote area health services, home and community nursing and emergency services”. Risk assessments should guide application at facility level. The evidence base mainly surrounded high risk and acute settings.

- “[Sharps] containers should […] conform to Standards AS 4031: 1992 and Amendment 1: 1996, AS/NZS 4261: 1994 and Amendment 1: 1997 or relevant international standard e.g. ISO 23907: 2019.”

“The Guidelines make reference to but do not include detailed information on: […] waste disposal”. Cited legislation underpinning recommendations is from Australian Commonwealth so these guidelines may not be specific to Scottish health and care settings.

Assessment of evidence
AS 3816:2018 standards for management of clinical and related wastes and a code of practice on the Management of Clinical and Related Wastes were referenced, but could not be accessed in full.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in health care. 2014 [cited 21 September 2023]	Guideline	**AGREE II Recommend with Modifications**	N/A	N/A	N/A
Assessment of evidence					
This guideline details requirements for waste bins to be used in isolation rooms for those with epidemic or pandemic prone respiratory infections. AGREE II Recommend with Modifications as per organisational criteria and completed critical appraisal. Update of WHO interim guidelines of same name from 2007. Updates include learning and evidence associated with pandemic H1N1 virus and “influenza-like illness” following the 2009 pandemic and other relevant evidence updates as determined through targeted systematic review (Annex L). Where informed by new evidence, the GRADE tool was used for appraisal. The guideline aimed to provide: “recommendations and other information relating to IPC measures for ARIs in health-care settings, with specific emphasis on ARIs that					

Assessment of evidence
have the potential for rapid spread and may cause epidemics or pandemics (or both)". Also covers standard precautions and baseline IPC expectations for preparedness. Intended users are “IPC professionals and members of IPC teams, health-care managers and policy-makers” as well as administrators. “The development of the guidelines followed the process established in the WHO handbook for guideline development, which involved active participation of the Global Infection Prevention and Control Network (GIPCN). The resulting recommendations were peer reviewed by internal and external experts.” The following guidance is provided in Annex E, detailing requirements for preparation of isolation rooms: “Place appropriate waste bags in a bin. If possible, use a touch-free bin. Ensure that used (i.e. dirty) bins remain inside the isolation rooms." **Limitations** • Global guidance so is not specific to Scottish health and care settings • No recommendations were focused on waste management, thus included evidence was in supporting text only. • Systematic review only addressed gaps in evidence, including lessons learned from the 2009 influenza pandemic. • Systematic review research questions were poorly reported. • Due to be updated in 2016 which has not been carried out, and update process reported would indicate new evidence from the COVID-19 pandemic should be incorporated. • Member affiliations are not reported. • A number of recommendations were carried forward from the previous update so some supporting evidence is likely to be outdated.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Standards New Zealand. Management of Healthcare Waste. 2002 [cited 22 September 2023]	Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This standard details requirements for waste bags and receptacles to be used in health and care settings in New Zealand and signposts to relevant standards.

This New Zealand standard contains best practice guidance (beyond legislative requirements) on human and animal healthcare waste disposal including classification, segregation, packaging/containment, labelling, storage and transport, where healthcare waste refers to all waste produced by a healthcare facility.

These standards aim to assist compliance with regulations and best practice in healthcare waste management.

A “container” is described as a receptacle for storing waste in the form of a bag or “hard shell vessel”.

It is stated that waste bags for healthcare waste (except sharps) should:

- Be strong enough to contain the waste category to which it’s assigned
- Be colour coded
- Conform to NZ standards for plastic bags

Bags for waste that require autoclaving should be labelled “autoclavable”.

Paper bags should not be used for hazardous waste.

Assessment of evidence
Rigid sharps containers should meet AS/NZ standards. **Limitations** • From 2002 so may not be reflective of current best practice • How best practice determined not clear • Guidance for compliance with NZ legislation

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS ISO 23907-2:2019 Sharps injury protection. Requirements and test methods. Reusable sharps containers. 2019	British Standard	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This British Standard is signposted in guidance as a requirement for reusable sharps containers (see entries for this research question). Not accessed in full – information from BSI.knowledge landing page.					

Assessment of evidence
These standards are for reusable sharps containers to prevent sharps injury protection. The documentation is aimed towards manufacturers, test centres and regulatory authorities. “ISO 23907 discusses sharps injury protection. ISO 23907-2 is an international standard that provides for reusable sharps containers for sharps injury protection. ISO 23907-2 is the second part of a multi-part series that outlines requirements for reusable sharps containers intended to hold potentially hazardous sharps medical waste with or without sharps protection features, e.g., scalpel blades, trocars, hypodermic needles, and syringes. ISO 23907-2 applies to sharps containers that are supplied completely by the manufacturer and to those that are supplied as components intended to be assembled by the user. ISO 23907-2 includes design functionality for user safety, lifespan simulation, cleaning and decontamination, microbiological validation, quality monitoring, and performance testing.”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
U.S. Food & Drug Administration. Sharps Disposal Containers in Health Care Facilities. 2021 [cited 27 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This guidance by the US FDA details requirements for sharps disposal containers. The US FDA provide guidance for sharps disposal containers to be used in US health facilities. Sharps disposal containers are described as “made from rigid puncture-resistant plastic or metal with leak-resistant sides and bottom, and a tight-fitting, puncture-resistant lid with an opening to accommodate depositing a sharp but not large enough for a hand to enter” (“generally” regulated by FDA as class II devices). The authors also define sharps. The US FDA provide pictures and diagrams demonstrating a syringe being placed into a sharps disposal container which is red with a red biohazard label. The diagram provided shows that the lid is tight-fitting and puncture-proof, the container is made from heavy-duty leak-proof plastic, stands upright and is stable, and labels are clear with big font and images.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHSScotland. Scottish Health Technical Memorandum 83. Fire safety in healthcare premises - General fire precautions. April 2004 [cited 04 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This Scottish guidance provides requirements for waste bags to be used in health and care settings.

Assessment of evidence
This is guidance that covers general fire precautions in healthcare settings. Waste is covered under 'waste disposal and collection' from 3.16. The following disclaimer is provided: "The contents of the various documents comprising NHS in Scotland Firecode are provided by way of guidance only. Any party making any use thereof or placing any reliance thereon shall do so only upon exercise of that party's own judgement as to the adequacy of 'Firecode' in the particular circumstances of its use and application." Under the heading "Waste disposal and collection", the following guidance is provided: • "Paper or plastic refuse sacks must be mounted on fixtures with self-closing lids, but these must not be located in corridors or escape routes. If located in a staff or patient care area, refuse sacks should be completely housed in a non-combustible container, for example a metal bin with a well-fitting, self-closing, metal lid, or in a fire-resisting enclosure. • A conspicuous and durable notice should be exhibited nearby, warning smokers against placing their spent materials in containers." **Limitations** • This guidance is still current, but as it is from 2004 some references contained may be outdated.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England. Health Technical Memorandum 07-01: Safe and sustainable management of healthcare waste 2022 [cited 23 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance provides requirements for waste bags and receptacles to be used in health and care settings, including colour coding and legislative requirements.

Health technical memoranda are described as “comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology” for healthcare delivery. This guidance targets safe and sustainable management of healthcare waste for all NHS Trusts, and laboratories and vet surgeries.

it is stated that this best practice guidance is not mandatory unless stated. Where authors have used this wording is indicated in the ETs by “”s. The authors provide the following guidance on these choices of wording:

- “must” for legal compliance
- “should” for a recommendation that is not mandatory
- “may” for permission

This guidance replaces the 2013 version, with the aim of supporting compliance with legislative changes and better capturing sustainability goals including the NHS Clinical Waste Strategy.

A list of contributors is provided, and a statement thanking those from the “scoping and technical engagement phases” indicating a consultation phase but not much detail is provided on how this guidance was formed, including no indication of systematic methods.

Target audience: those involved in NHS waste management (details on relevant sections by job role are signposted in Table 1, p.4), targeted towards compliance with English legislation and regulations so should not be “relied upon” by devolved nations.

The following segregation guidance is provided for compliance with English legislation:

- Regular training and written and visual reminders, colour-coded and labelled receptacles facilitate correct segregation
- Type and quantity of bin should depend on quantity of different types of waste produced determined by waste audit
- Colour of “bodies of bins” does not matter, but bag, bin lid and/or label should match the colour coding system
- Table 9 outlines requirements for NHS England segregation, colour coding and storage

Assessment of evidence

The following transport and packaging guidance is provided for compliance with English legislation:

- Dangerous goods are defined as “solids, liquids or gases that can harm people, other living organisms, property or the environment”
- Table 11 outlines common packaging UN numbers, shipping name and instructions for healthcare wastes under the ADR, with Tables 12 and 13 outlining the packaging instructions (UNECE’s 2020 Agreement concerning the International Carriage of Dangerous Goods by Road). The authors also state that “All packaging, including UN-approved packaging or packaging for limited quantities used for dangerous goods, must be fit for purpose and capable of safely containing the goods when used in transport, whether it is carrying liquids or solids.” Packages whose UN label contain an S should only contain solids or be used as inner packages. Sharps receptacles tend to be designed for solids so should not be used for liquid disposal, although there may be some liquid residue so packaging should be capable of containing this residue, e.g. using absorbent material. Intermediate Bulk Containers should be inspected every five years and labelled indicating they are fit for purpose. Limited quantities of some waste do not need to be labelled with the UN number under ADR, but this exemption does not apply to clinical waste or category A waste. Common packaging issues are described in Table 14 and waste medicines and batteries guidance is provided. Large packaging/wheelie bins are described was requiring UN number as well as being lined with a UN-certified plastic bag

Chapter 6 describes “key principles associated with key management functions”, wherein organisation-specific waste management policy is described.

For primary care, waste bags and sharps containers “should” follow packing and storage requirements described in previous chapters.

Limitations

- The Welsh HTM 07-01 is based on the old 2013 HTM 07-01. However, this current version is also linked out in NHS Wales web pages, so it is not clear if Welsh NHS boards are also to follow this guidance.
- Unclear methodology and inconsistent in text citations used.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland Waste Management Guidance: Scottish Health Technical Note 03-01. Version 7.0. 2023 [updated 09 December 2024; cited 02 November 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance details requirements for waste bags and receptacles to be used in Scottish health and care settings, including requirements for compliance with legislation.

This guidance aims to help boards in NHSScotland meet waste management legal, policy, procedural requirements and best practice in Scotland, applicable to NHSScotland healthcare services producing waste, superseding the SHTN 03-01 Parts A to D. It is stated that NHSScotland staff and contractors should not rely on the HTM 07-01 or UK-wide waste management guidance alone due to differing legal requirements across the UK.

Target audience: “staff and contractors involved at all stages of waste management in the modern healthcare setting”

Written by the NHSScotland Waste Management Steering Group. Member names and job titles are not provided.

Endorsed by SEPA.

A disclaimer is provided stating that the guidance is “general” and accurate at time of publication.

Assessment of evidence

Training and audit requirements are also described in chapters 14 and 15 respectively but are out-with the remit of this review.

Transport:

- The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 – “subject to regulatory control”. “intended to reduce to reasonable levels the risk of harm or damage to people, property and the environment posed by the carriage of dangerous goods.”, where dangerous goods are “substances with intrinsic hazards posing a potential risk to persons or the environment while in the transport chain.” Do not regulate waste materials specifically but rather all dangerous goods depending on hazardous characteristics and classification (nine classes) which then influences packaging, labelling and transport requirements. Table 1.1. describes these nine UN classifications, hazard warning label and examples specific to healthcare
- It is stated that the Carriage Regulations reference the ADR to address:
    - “training of personnel involved in the chain of distribution
    - substance clarification and identification
    - packaging
    - marking, labelling and documentation
    - safety equipment and emergency procedures
    - safe loading
    - vehicle specification and operation”
- appointment of a Dangerous Goods Safety Advisory under the Carriage Regulations is described (p.14)

Waste receptacle standards: “In Scotland, waste producers are able to procure, via a national contract from National Services Scotland (NSS) National Procurement, colour-coded containers which meet the requirements of the NHSScotland best practice colour-coding system. These containers should meet the requirements of NHSScotland Fire codes and safety. Evaluation of receptacle suitability should be made at Board level, taking into consideration local circumstances.”

Category A packaging - “In the highly unlikely event that the waste does meet the criteria for Category A waste (such as a notifiable disease), it should be classified as UN3549 and placed in appropriate yellow UN-approved packages for this type of waste (which may

Assessment of evidence
differ from other yellow containers used in hospitals). Wherever possible, Category A infectious substances (including waste) should be treated on site (using an autoclave or equivalent) before being transported for disposal. Once treated it should be classified as clinical waste (Category B infectious substance - UN3291) on a precautionary basis and to ensure it is rendered unrecognisable." "Specific" waste stream segregation: • sharps containers should be colour-coded and "fit for purpose" Systems to promote "successful" segregation of waste are described, including "appropriate equipment": • receptacles should be colour-coded and labelled It is stated that sealed healthcare waste bins tend to be opaque but it is not stated if this is considered best practice. "A range of approved colour-coded primary packaging and colour-coded bins is available from National Services Scotland (NSS) National Procurement. These products have been assessed and meet fire standard and infection control requirements." "The Carriage Regulations specify the requirements for packaging, marking and labelling of dangerous goods." "Once the UN number of a substance is known, international carriage by road (ADR) provides information on the packing group, packing instruction and any special packing provisions (including any restrictions applying to mixed packaging) that apply." Examples of these for healthcare wastes are provided in Table 6.1, where Category A waste should have "Three-part packaging" and Category B waste should have "Rigid packaged or back in wheeled bins", "Bulk approved bags may be used in combination with BK2 approved containers or vehicles". Only UN-tested and approved packaging should be used for packaging instructions. Examples of UN marks for such approved packages are provided in Figures 6.1 and 6.2. UN-approved containers can be a package ("container with a capacity smaller than that of either a large Package or an Intermediate Bulk Container", large package ("an outer package that contains articles or inner packaging with a minimum capacity of 400Kg net weight or 450 Litres. The total volume should not exceed 3 M^3"), and intermediate bulk container ("rigid or flexible package that has a capacity of not more than 3 M^3 and is designed for mechanical handling") "large packages must only be used in conjunction with inner packages (bags or sharps containers) and must be marked/ labelled on two opposite sides"

Assessment of evidence
“If the letter ‘S’ appears in the UN mark, as shown above, the packaging may only be used for solids and not free liquids. Most sharps boxes are type- approved for solids only and must not be used for the disposal of liquids” “Some large plastic wheeled bins in circulation are marked and tested as IBC (codes for these will start with either 11, 13, 21 or 31) and care should be exercised when using these as they have a shelf life of 5 years from the date of manufacture and cannot be used for transport after this date” Requirements for limited quantity exemptions are described, but it is stated that there are none for infectious (clinical) waste with code UN3291

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. Sharps injuries - What you need to do. n.d. [cited 08 September 2023] Accessed 08 September 2023.	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This HSE guidance provides requirements for sharps containers to be used in health and care settings. This guidance is present on the HSE webpage under the sharps injuries topic. This organisation is based in the UK so is likely relevant to Scottish health and care settings, although this is not stated. Intended audience, intended users, authors, year of publication and					

Assessment of evidence
development methods are not reported. In “further information” tab there is a link to a systematic review on sharps which may have contributed to this guidance. This systematic review however states that sharps disposal is out-with the remit. This guidance advises that sharps containers should be portable so that they can be placed at point of production, and be designed to allow easy and safe disposal of sharps immediately. Design should also “prevent overfilling and accidental spillage of contents”, close easily (temporarily and permanently) and be puncture-resistant.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Public Health Agency of Canada. Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings. 2017 [cited 07 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This guidance describes requirements for waste bags and sharps containers for use in Canadian health and care settings. Canadian Government guidance outlining “routine” and “additional” IPC healthcare practices and modifications to these practices for all healthcare settings. Designed for use by IPC professionals, to develop specific recommendations for local use. Revision from last version.					

Assessment of evidence
Developed with a working group of varied backgrounds relevant to IPC but methodology isn't reported. Based on research findings "wherever possible" with consensus by experts in the field filling in the gaps. • biomedical waste bags should be "impervious" • sharps containers should be puncture resistant • No-touch waste receptacles should be used for disposal of following respiratory hygiene as well as used gloves and respirators.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS EN ISO 7765-1:2004 Plastics film and sheeting. Determination of impact resistance by the free-falling dart method – Staircase methods. 2004 Under review.	British Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence
The international standard equivalent of this British Standard is signposted in WHO guidance as a requirement for plastic waste bags (see above entry). This standard could not be accessed in full. Current, under review – no further information provided.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS ISO 7765-2:2022 Plastics film and sheeting. Determination of impact resistance by the free-falling dart method – Instrumented puncture test. 2022	British Standard	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
The international standard equivalent of this British Standard is signposted in WHO guidance as a requirement for plastic waste bags (see above entry). This standard could not be accessed in full. The following overview is provided on the British Standards Institute website:					

Assessment of evidence
“This document specifies a test method for the determination of puncture impact properties of a plastic film using instruments for measuring force and deflection. It is applicable if a force-deflection or force-time diagram, recorded at nominally constant striker velocity, is required for detailed characterization of the impact behaviour. This test method is also required when a small number of test specimens are available, and the staircase method described in the ISO 7765-1 cannot be applied. The test method is applicable to films of up to 1 mm thickness and makes it possible to compare impact-penetration forces, biaxial deformabilities and energy-absorption capacities of films. Also, the transition region between brittle and tough behaviour of the film under the conditions of testing can be determined by varying the temperature or the penetration velocity or the relative humidity[1]” Current, under review.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
United Nations Economic Commission for Europe. Agreement Concerning the International Carriage of Dangerous Goods by Road. 2023 [cited 12 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence
This legislation is signposted in SHTN 03-01 as applicable to waste receptacle requirements in Scottish health and care settings (see above entry). Known as the 'ADR', this international legislation governs transportation of dangerous goods: "According to article 2 of the Agreement, dangerous goods barred from carriage by Annex A shall not be accepted for international transport, while international transport of other dangerous goods shall be authorized subject to compliance with: • the conditions laid down in Annex A for the goods in question, in particular as regards their packaging and labelling; and • the conditions laid down in Annex B, in particular as regards the construction, equipment and operation of the vehicle carrying the goods in question." Chapter 3.2 contains the "Dangerous goods list" (Table A): • UN No. 2814 – infectious substance affecting humans • UN No. 2814 – infectious substance affecting humans, in refrigerated liquid nitrogen • UN No. 2814 – infectious substance affecting humans (animal material only) Where Annex A provides "General provisions and provisions concerning dangerous substances and articles" including: • packaging and tank provisions (part 4) • consignment procedures including marking and labelling (part 5) • packaging requirements (part 6)

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Personal Protective Equipment at Work Regulations 1992. 1992 [cited 13 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in RCN and NICE guidance as applicable to sharps container provision in UK health and care settings (see above entry). In the Explanatory Note, it is stated that “These Regulations impose health and safety requirements with respect to the provision for, and use by, persons at work of personal protective equipment.”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Control of Substances Hazardous to Health Regulations 2002. 2002 [cited 24 August 2023].	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in RCN and NICE guidance as applicable to sharps container provision in UK health and care settings (see above entry).					

Assessment of evidence
In the Explanatory Note, it is stated that “These Regulations re-enact, with modifications, the Control of Substances Hazardous to Health Regulations 1999 (S.I. 1999/437) (“the 1999 Regulations”). The 1999 Regulations imposed duties on employers to protect employees and other persons who may be exposed to substances hazardous to health and also imposed certain duties on employees concerning their own protection from such exposure, and prohibited the import into the United Kingdom of certain substances and articles from outside the European Economic Area.” Regulation 7 corresponds to “prevention or control of exposure to substances hazardous to health” detailed further in corresponding HSE guidance supporting compliance (see below entry).

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety at Work etc. Act 1974. 1974 [cited 13 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in RCN and NICE guidance as applicable to sharps container provision in UK health and care settings (see above entry). “An Act to make further provision for securing the health, safety and welfare of persons at work, for protecting others against risks to health or safety in connection with the activities of persons at work, for controlling the keeping and use and preventing the unlawful acquisition, possession and use of dangerous substances”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Management of Health and Safety at Work Regulations 1999. 1999 [cited 13 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in RCN and NICE guidance as applicable to sharps container provision in UK health and care settings (see above entry). These regulations are “in relation to measures relating to employers’ obligations in respect of the health and safety of workers”.					

Evidence from previous update(s):

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Institute for Health and Care Excellence (NICE). Healthcare-associated infections: prevention and control in primary and community care.	Guideline	**AGREE II Recommend**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
2012 [updated 2017]					

Assessment of evidence

These guidelines describe the standards which sharps containers should comply with, and relevant legislation regarding provision of sharps containers in UK health and care settings.

These guidelines aim to provide standard healthcare-associated infection prevention and control guidelines for healthcare workers working in primary and community care settings.

Systematic literature searches were run, with most recent searches for the 2012 update carried out on 18 April 2011 on MEDLINE, Embase, CINAHL and The Cochrane Library. Titles and abstracts of identified papers were screened by a research fellow and full papers were compared to inclusion/exclusion criteria so that studies relevant to the research questions could be appraised. Clinical findings informed recommendations. However, where clinical evidence was lacking or poor quality, the guideline development group provided input. There was an external review process as part of the guidelines' validation process.

In chapter 4 (Guideline summary), key priorities are highlighted, including:

- "Everyone involved in providing care should be: trained in hand decontamination, the use of personal protective equipment, and the safe use and disposal of sharps." [2012]
- "Wherever care is delivered, healthcare workers must have appropriate supplies of: sharps containers" [new 2012]
- It is stated that at the time of publication in 2012, this recommendation was required for compliance with the following health and safety legislation: "Health and Safety at Work Act 1974, Management of Health and Safety at Work Regulations 1999, Health and Safety Regulations 2002, Control of Substances Hazardous to Health Regulations 2002, Personal Protective Equipment Regulations 2002, and Health and Social Care Act 2008"

In chapter 8 ("Standard principles for the safe use and disposal of sharps"):

- The following guidance on safe sharps disposal was updated in line with legislation:

Assessment of evidence

- “Used sharps must be discarded immediately into a sharps container conforming to current standards by the person generating the sharps waste” [new 2012]
  - To comply, those generating sharps waste should have access to sharps containers meeting required standards
  - The authors signpost to BS EN ISO 23907:2012

Limitations

- One major limitation is that it is not clear how many researchers contributed to the systematic literature searches.
- It is stated that, as of 2017, the guideline has been transferred to the “static list”, but it is not clear what this is as the hyperlink to the static list does not work.
- The safe disposal of waste chapter has not been included in this AGREE appraisal as the authors state that “A literature search was not performed for these questions as the objective was to review and update the current recommendations about the safe disposal of personal protective equipment and safe disposal of sharps in line with patient care and with the European Union (EU) and national legislations. The Department of Health guidance; Safe Management of Healthcare Waste version 1.072 was reviewed.” This DoH document is now out of date and has been captured elsewhere in the review.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Sunley K, Gallagher R, Reidy MP, et al. Essential Practice for Infection Prevention and Control - Guidance for nursing staff. London: Royal College of Nursing, 2017	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance signposts to standards which sharps containers used in UK health and care settings should comply with.

This document produced by the Royal College of Nursing is practice guidance based on evidence-based consensus to influence care decisions, with a focus on good infection prevention and control practices.

Under “Safe handling and disposal of sharps”:

Sharps are defined as encapsulating “needles, scalpels, stitch cutters, glass ampoules, bone fragments and any sharp instrument”, presenting risk of blood borne virus if a sharps injury occurs. An example of sharps injuries from sharps being put in waste bins is provided. Therefore, sharps should be disposed of safely according to local policy.

As such, the authors provide “best practice points” for sharps use:

- Sharps containers should meet the BS EN ISO 23907 standard.

Limitations

- This document was due to be updated in November 2020 but has not been.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health and Health Protection Agency. Prevention and control of infection in care homes – an information resource 2013 [cited 03 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance details requirements for plastic waste bags used in care homes in England.

Best practice infection prevention and control guidance for staff caring for residents in care homes in England and should be read in conjunction with "The Health and Social Care Act 2008: Code of Practice on the prevention and control of infections and related guidance". The authors state that not all of the guidance will be applicable to all care homes.

Target audience: "Care Trust CEs, GPs, Communications Leads, Consultants in Communicable Disease Control, Community Infection Control Nurses, Health Protection Nurses, Care Home Managers, Care Quality Commission"

Under Part 3 that addresses "Basic infection prevention and control practices" i.e. Protocols that should be applied by all care workers at all times to reduce likelihood of infection", Plastic waste bags should "be constructed of plastic of a gauge appropriate to intended use, to avoid splitting and spillage contents"

Limitations

- For waste management, the bibliography references the DoH Safe management of healthcare waste guidance which is now archived

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Sehulster L, Chinn RY; CDC; HICPAC. Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). MMWR Recomm Rep. 2003;52(RR-10):1-42.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance includes specific evidence-based recommendations regarding requirements for sharps containers, and describes evidence regarding requirements for regulated medical waste receptacles in general.

The aim of this document was to provide evidence-based environmental infection control guidance for prevention of “environmentally mediated infections, particularly among health-care workers and immunocompromised patients”.

Studies included were outbreak studies (considering “environmental opportunistic microorganisms and epidemiological- or laboratory experimental studies”) and organisational standards and guidelines, supplemented by expert opinion where there was insufficient evidence.

Assessment of evidence
Although literature searches were carried out, there was not enough evidence to deduce that methods were systematic, so this guidance was graded as Level 4. Recommendations: For sharps disposal (Category IC): • Sharps disposal containers should remain impermeable after treatment to avoid injury • Disposable syringes with needles (including sterile sharps), scalpel blades, and other sharps should be placed in puncture-resistant containers as close as possible to point of use Regulated wastes waiting to be treated, should be stored in waste containers designed to prevent noxious odours developing (Category IC) Within the summary of evidence on managing regulated medical waste, it is also stated that: • "A single, leak-resistant biohazard bag is usually adequate for containment of regulated medical wastes, provided the bag is sturdy and the waste can be discarded without contaminating the bag's exterior […] Puncture-resistant containers located at the point of use (e.g., sharps containers) are used as containment for discarded slides or tubes with small amounts of blood, scalpel blades, needles and syringes, and unused sterile sharps.", referencing OSHA occupational exposure guidance from 1991 Note – in the appendices the authors signpost to an external source on regulated medical wastes in the U.S, where it is stated that (regulated) medical waste is "healthcare waste that that may be contaminated by blood, body fluids or other potentially infectious materials"

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Health and Safety (Sharp Instruments in Healthcare) Regulations 2013. 2013 [cited 03 October 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in RCN guidance as applicable to sharps container provision in UK health and care settings (see above entry). In the Explanatory Note, it states that “Regulation 5 concerns the use and disposal of medical sharps – in particular, it provides that the use of medical sharps should be avoided so far as is possible, otherwise that ‘safer sharps’ are used where possible. It prohibits the practice of ‘re-capping’ except where required to control risk and where the risk to the employee is controlled by means of special equipment”. In relation to sharps disposal, Regulation 5 states that “(d) in relation to the safe disposal of medical sharps that are not designed for re-use— (i) written instructions for employees, and (ii) clearly marked and secure containers, are located close to areas where medical sharps are used at work.”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS EN ISO 23907-1:2019 Sharps injury protection - Requirements and test methods - Single-use sharps containers. 2019	British Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This British Standard is signposted in guidance as a requirement for single use sharps containers (see entries for this research question).

BS EN ISO 23907-1:2019 “specifies requirements for single-use sharps containers intended to hold potentially hazardous sharps medical waste with or without sharps protection features, e.g. scalpel blades, trocars, hypodermic needles and syringes.”

Applies to both assembled and unassembled single-use sharps containers but not to reusable containers or sharps “containers used in the transportation of filled single-use sharps containers.”

Requirements are defined by construction (stability, handle strength, aperture, closure, resistance to penetration, resistance to damage or leakage once dropped or toppled, fill line indicator), labelling and marking, instructions for use, and methods for testing construction characteristics.

Rationale for the standards are in Annex A.

Question 5: Where should waste receptacles be placed in health and care settings?

Evidence added to Literature Review V5.0

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health. Health Building Note 00-09: Infection control in the built environment. 2013 [cited 28 August 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This guidance includes specific recommendations for placement of waste bins in the built environment for infection prevention and control purposes. This Health Building Note aims to address IPC issues and risks to address during project design and construction. This guidance can be applied to all healthcare facilities, but does not extend to operational IPC management like outbreaks or standard precautions. It is intended to be cross referenced with the Health and Social Care Act 2008: Code of Practice Target audience: “all providers of NHS care”; “NHS Trust CEs, Care Trust CEs, Foundation Trust CEs, Medical Directors, Directors of PH, Directors of Nursing, Allied Health Professionals, Communications Leads, Emergency Care Leads” The authors highlight that to encourage “desired behaviour”, the following should be considered in healthcare facility design: • Segregation and management of waste					

Assessment of evidence
• Domestic waste receptacles • Bedside waste disposal Clinical wash-hand basins should have “hands-free waste bins” containing colour-coded waste bags next to each wash-hand basin for hand drying Waste receptacles should be placed close to point of production “to avoid unnecessary handling of waste”, and there should be sufficient space for segregation at ward/unit level (see HTM 07-01) Recommendations: • Design should allow for enough space for hands-free waste bins close to hand-wash basins • Waste receptacles should be easy to clean and hands-free (foot-operated) • Waste receptacle lids should be easily cleaned/disinfected

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
European Centre for Disease Prevention and Control (ECDC). Safe use of personal protective equipment in the treatment of infectious diseases of high consequence: A	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
tutorial for trainers in healthcare settings. 2014 [updated 03 December 2014; cited 29 August 2014]					

Assessment of evidence

This guidance provides suggested placements of non-sharp waste disposal containers for HCID waste.

This ECDC tutorial aims to contribute to better hospital preparedness in Europe by addressing technical requirements for PPE for HCID, critical aspects of these ensembles, protection beyond PPE and occupational safety and health. This document was developed by ECDC and external experts, addressing documents on PPE for Ebola patient care (from international and European organisations) and guidelines and training materials from the WHO, US CDC and Medicins sans Frontieres.

Target audience: Mainly “future PPE instructors with a background in infection control and hygiene in hospital settings” and “professionals in communicable diseases, infection control and hospital hygiene experts, hospital managers in charge of administration, nursing, OSH and emergency planning [; …] experts in preparedness at the regional and national levels”

Under “Considerations on barrier management”, the authors state:

- “Temporary disposal sites should be located as close as possible to the patient care area” for solid non-sharp waste disposal in “impermeable, clearly labelled bags”
- Waste bags from the red zone should not be processed in the isolation unit, and should be cleaned and disinfected in the yellow zone

Limitations

- Described as a living document but no updates past 2014 recorded

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Control and Prevention. Procedures for Safe Handling and Management of Ebola-Associated Waste. 2022 [cited 08 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance provides guidance regarding placement of waste receptacles for waste from EVD and MVD patient care.

This CDC guidance aims to provide detailed protocols to be read in conjunction with the CDC guidance on “Ebola-Associated Waste Management”. It is stated that this guidance is applicable to Ebola Disease and Marburg Virus Disease, and the page is currently being reviewed so the terminology used is true to this.

Target audience: “Hospital infection control, occupational health systems, and facility medical waste managers and personnel”

Under “Supplies for Hand Hygiene, Cleaning and Disinfection, and Packaging Waste”:

A list of equipment is provided:

- Waste container placed in the patient’s room

Under “Primary Packaging of Medical Waste in Patient’s Room”:

Receptacles like sharps containers and primary packaging (double-bagged waste) should be placed in the patients’ room by a healthcare worker wearing appropriate PPE.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Safe management of wastes from health-care activities, 2nd ed. 2014 [cited 15 September]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

The WHO provide guidance regarding placement of waste receptacles and sharps containers. This guidance is not supported by in-text citations.

This WHO guidance provides guidance on safe handling and disposal of waste from health care globally, also addressing waste management options for developing countries. This second addition of 'The Blue Book' updates guidance from 2007.

This guidance comprises of expert opinion from "internal consultation and collaboration" at a conference in 2007, with peer-review of each chapter from experts worldwide. Names of those who contributed to the first edition are provided in appendix 1.

Target audience: "medical staff, health-care facility directors, ancillary health workers, infection-control officers and waste workers […] regulators, policy-makers, development organizations, voluntary groups, environmental bodies, environmental health practitioners, advisers, researchers and students"

Specifications for waste containers are provided.

Waste receptacles should be readily available to waste producers in each area that produces waste in a healthcare setting to facilitate segregation at point of waste production and reduce transport of waste through clinical areas.

Assessment of evidence
Waste receptacles should be taken to patient beds if bedside intervention takes place e.g. sharps bins taken to patients when getting blood sample taken The authors suggest mobile trolleys with infectious waste and sharps containers, or placing general waste and infectious waste containers away from patients e.g. utility rooms, treatment rooms and nurses' stations. Waste containers for segregation of hazardous vs non-hazardous waste should be placed close to each other where possible. Infectious waste containers should not be placed in public areas to avoid improper segregation by patients and visitors or exposure to infectious waste Static containers should be placed close to sinks and washing facilities Waste containers should be similar sizes so that staff do not show preference for placing waste in the larger receptacle Replacement bags or containers should be available for replacing sealed containers. Waste receptacles should be regularly cleaned. Sharps boxes should be placed where injections take place The following points should be covered in training for healthcare workers involved in waste management: "Nursing and clinical staff should ensure that adequate numbers of bag holders and containers are provided for the collection, and subsequent onsite storage, of health-care waste in the medical areas, clinics, theatres and other areas where waste is generated. These receptacles should be located as close as practicable to the common sources of waste generation in a medical area." **Limitations** • This guidance is from 2014 so some guidelines may be out of date

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Gallagher R, Cameron L and Sunley K. Sharps safety. RCN guidance for the prevention and management of sharps injuries in health and social care settings 2023 [cited 19 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This RCN guidance addresses placement of sharps containers, but evidence underlying this guidance is not clear.

The RCN is a UK union and professional body for nursing. This guidance document was made in association with "The RCN UK Safety Representatives' Committee Rose Gallagher, RCN Professional Lead for Infection Prevention and Control, Leona Cameron, RCN Head of Health, Safety and Wellbeing, Kim Sunley, Health, Safety and Wellbeing National Officer." The guidance is "intended for use in the UK" but can be extrapolated for other countries where appropriate. Information is said to be "compiled from professional sources, but its accuracy is not guaranteed.".

- Engineering controls for sharps safety: "adequate numbers of easily accessible sharps disposal containers".
- Work practice controls for sharps safety: "placing sharps containers at eye level and within arm's reach."

References provided at the end of the document, alongside other resources.

Assessment of evidence
Limitations • No methodology or development process is reported nor are member names and affiliations involved in development of these guidelines. • No strength of recommendations provided based on available evidence. • Unclear whether evidence has been graded for use in these guidelines.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health & Social Care. Infection prevention and control: resource for adult social care. 2022 [cited 20 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This guidance addresses placement of sharps containers when used in adult social care settings in the UK. This guidance outlines IPC principles for preventing and managing infections in adult social care, where adult social care covers activities helping the elderly, those living with disabilities or physical/mental illness out-with NHS services, unpaid carers included. This guidance is based off information from NICE, NHS, government departments and other professional regulatory bodies, but Care Quality Commission providers should also comply with those regulations and Code of Practice.					

Assessment of evidence
Target audience: “those responsible for setting and maintaining standards of IPC within adult social care in England” Sharps containers should be placed at point of production in a “safe position” and should have a “temporary closing mechanism” to reduce likelihood of spills. **Limitation** • Please note that Appendix 1 contains links for “further information” including the NIPCM waste review (link broken). Since references are not provided, it is not clear if this was one of the documents which informed this guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare. 2019 [cited 20 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This Australian guidance details a good practice statement supporting sharps bin placement at point of sharps waste production. These Australian guidelines are nationally accepted for IPC “core principles and priority areas for action” with the intent to guide development of protocols and processes. The intended audience is healthcare workers and healthcare facilities. The guidance is					

Assessment of evidence
“underpinned by a risk-management framework to ensure the basic principles of infection prevention and control can be applied to a wide range of healthcare settings including hospitals, day procedure units, office-based practice, long-term care facilities, remote area health services, home and community nursing and emergency services”. Risk assessments should guide application at facility level. The evidence base mainly surrounded high risk and acute settings. Under the heading “Use and management of sharps, safety engineered devices and medication vials” The following is listed under “Individual actions for reducing risk” when handling sharps: “Make sure every used sharp medical device such as needles, scalpels etc. are disposed of properly in puncture-resistant sharps containers located at the point-of-use.” A Good practice statement is made: “It is good practice to dispose of single-use sharps immediately into an approved sharps container at the point-of-use”. The practical information regarding single-use sharps disposal reads: • “Sharps containers must be appropriately placed so that they are at an accessible height for the healthcare worker but out of reach of children and others to prevent hands and fingers entering the disposal unit. They should also be placed in a secure position or mounted on the wall to prevent tipping (approx. 1300 mm minimum off the ground). Placement of wall-mounted units should be away from general waste bins to minimise the risk of incorrect disposal.” • “[Sharps] containers should be located at the point of use or, if this is not possible, as close as practical to the use area.” Under the heading “Droplet precautions”: The following is stated under practical information regarding patient placement: “In primary care and other office-based practice, examples of appropriate implementation of droplet precautions include segregation in waiting rooms for patients with violent or frequent coughing, and the availability of tissues, alcohol-based hand rub and a waste bin so that patients can practice respiratory hygiene and cough etiquette.”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in health care. 2014 [cited 21 September 2023]	Guidance	**AGREE II Recommend with Modifications**	N/A	N/A	N/A

Assessment of evidence

Supporting information within this guideline informs placement of sharps containers and waste bins for isolation rooms.

AGREE II Recommend with Modifications as per organisational criteria and completed critical appraisal.

Update of WHO interim guidelines of same name from 2007. Updates include learning and evidence associated with pandemic H1N1 virus and “influenza-like illness” following the 2009 pandemic and other relevant evidence updates as determined through targeted systematic review (Annex L). Where informed by new evidence, the GRADE tool was used for appraisal. The guideline aimed to provide: “recommendations and other information relating to IPC measures for ARIs in health-care settings, with specific emphasis on ARIs that have the potential for rapid spread and may cause epidemics or pandemics (or both)". Also covers standard precautions and baseline IPC expectations for preparedness. Intended users are “IPC professionals and members of IPC teams, health-care managers and policy-makers” as well as administrators. “The development of the guidelines followed the process established in the WHO handbook for guideline development, which involved active participation of the Global Infection Prevention and Control Network (GIPCN). The resulting recommendations were peer reviewed by internal and external experts.”

Assessment of evidence
The following guidance is provided in Annex B for Isolation precautions, with no supporting in-text citations: • “Dispose of syringes, needles, scalpel blades and other sharp items in appropriate puncture-resistant containers. Such containers should be located as close as practicable to the area in which the items were used” • Preparation of isolation rooms: “Place appropriate waste bags in a bin. If possible, use a touch-free bin. Ensure that used (i.e. dirty) bins remain inside the isolation rooms." **Limitations** • Global guidance so is not specific to Scottish health and care settings • No recommendations were focused on waste management, thus included evidence was in supporting text only. • Systematic review only addressed gaps in evidence, including lessons learned from the 2009 influenza pandemic. • Systematic review research questions were poorly reported. • Due to be updated in 2016 which has not been carried out, and update process reported would indicate new evidence from the COVID-19 pandemic should be incorporated. • Member affiliations are not reported. • A number of recommendations were carried forward from the previous update so some supporting evidence is likely to be outdated.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Infection prevention and control guideline for Ebola and Marburg disease. 2023 [cited 10 November 2023]	Guidance	**AGREE II Recommend with Modifications**	N/A	N/A	N/A

Assessment of evidence

Supporting information within this guideline provides additional guidance regarding placement of waste bins and sharps containers for isolated EVD/MVD patients.

Guideline “provides IPC recommendations for Ebola and Marburg disease outbreaks” with a healthcare focus and wider consideration of community settings. These recommendations should be followed during readiness or response activities. Core and development team members and affiliations are listed, including methodology experts. New evidence should result in updates (no timeline provided). Previous update recommendations have been incorporated alongside new evidence and a distinction made where appropriate. Intended audience: “policy-makers, health-care administrators and managers, IPC specialists, logisticians, community workers, burial teams and all health and care workers.”

Methods: a “guideline development group” made of diverse backgrounds and an “external peer-review group” were involved in the review and consultation process. GRADE was used to appraise appropriate evidence. Systematic reviews from previous updates were summarised and their recommendations incorporated where appropriate. This 2023 update involved a series of studies: systematic review, rapid reviews, scoping review and mixed methods study. The systematic review was used for an AGREE II appraisal and graded AGREE Recommend with Modifications, based on ARHAI criteria.

Under the heading “Isolation and management of suspect or confirmed cases”, the following is stated regarding practical information supporting patient placement:

Assessment of evidence
• Should have waste ‘bin’ in isolation rooms for Ebola/Marburg patients, screening areas, triage areas. • Should have sharps containers in isolation rooms for Ebola/Marburg patients and triage areas. **Limitations** • These are global recommendations and will be applicable to Scottish health and care settings if there were an outbreak of Ebola virus or Marburg disease. • Poor distinction between methodologies and findings of each development process different studies carried out. • Poor reporting of search strategies, time ranges and inclusion/exclusion criteria. • Poor description of populations likely influenced by the content of these guidelines. • No statement of influence of funding bodies. • Tools are yet to be published. • Timeline and methods for update are not provided.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. Scottish Health Facilities Note 30 Part A: Manual. Information for Design Teams, Construction Teams,	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Estates & Facilities and Infection Prevention & Control Teams. 2014 [cited 04 October 2023]					

Assessment of evidence

This SHFN provides guidance regarding placement of waste receptacles in Scottish health and care settings.

Scottish Health Facilities Note 30 (SHFN 30) Part A is considered the 'manual' within a series covering IPC best practice considerations in the built environment. Part B covers implementation and assessment and Part C contains question sets and checklists. Compliance is to guide fulfilment of mandatory requirements as per the NIPCM. This version (4.0) is the most recent update. The 'waste management' section sits within '5. Typical rooms: purpose and content'. "Disclaimer The contents of this document are provided by way of general guidance only at the time of its publication. Any party making any use thereof or placing any reliance thereon shall do so only upon exercise of that party's own judgement as to the adequacy of the contents in the particular circumstances of its use and application." Health Facilities Scotland is within National Services Scotland and this guidance applies to Scottish health and care settings.

- "Any new capital developments should have enough space for waste receptacles to be located close to the point of waste production."
- "Healthcare waste receptacles should not be accessible to the public."

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHSScotland. Scottish Health Technical Memorandum 83. Fire safety in healthcare premises - General fire precautions. April 2004 [cited 04 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This SHTM provides guidance regarding placement of waste receptacles in Scottish health and care settings.

This is guidance that covers general fire precautions in healthcare settings. Waste is covered under 'waste disposal and collection' from 3.16. "Disclaimer The contents of the various documents comprising NHS in Scotland Firecode are provided by way of guidance only. Any party making any use thereof or placing any reliance thereon shall do so only upon exercise of that party's own judgement as to the adequacy of 'Firecode' in the particular circumstances of its use and application."

- "Paper or plastic refuse sacks must be mounted on fixtures with self-closing lids, but these must not be located in corridors or escape routes. If located in a staff or patient care area, refuse sacks should be completely housed in a non-combustible container, for example a metal bin with a well-fitting, self-closing, metal lid, or in a fire-resisting enclosure.
- A conspicuous and durable notice should be exhibited nearby, warning smokers against placing their spent materials in containers."

This guidance is still in use, but as it is from 2004 some references may be outdated

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Strengthening infection prevention and control in primary care. 2021 [cited 09 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

The WHO describe guidance for placement of waste receptacles in primary care for IPC purposes.

This guidance document outlines core components of infection prevention and control (IPC) in primary care and is informed by existing WHO guidance. This was developed by the WHO Department of Integrated Health Services (Universal Health Coverage and Life Course Division). Individual members are listed alongside their affiliations. This aims to be a more concise summary of WHO acute healthcare IPC recommendations than existing guidance from which the information is obtained, so there is no published methodology. The document contains standards, indicators and tools for IPC. Waste management is listed as a core component of IPC standard operating procedures (SOPs), alongside built environment considerations. There is further information on IPC committees later in the document, but not in relation to waste management. This is global guidance so is not specific to Scottish health and care settings. Recommendations for waste management are minimum requirements.

Regarding the core component of “Built environment, materials and equipment for IPC”, the following is stated:

- Bins suited to segregated waste management should be less than 5m from the point of waste generation and should be labelled accordingly.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland Waste Management Guidance: Scottish Health Technical Note 03-01. Version 7.0. 2023 [updated 09 December 2024; cited 02 November 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

SHTN 03-01 provides guidance regarding placement of waste receptacles in Scottish health and care settings.

This guidance aims to help boards in NHSScotland meet waste management legal, policy, procedural requirements and best practice in Scotland, applicable to NHSScotland healthcare services producing waste, superseding the SHTN 03-01 Parts A to D. It is stated that NHSScotland staff and contractors should not rely on the HTM 07-01 or UK-wide waste management guidance alone due to differing legal requirements across the UK.

Target audience: “staff and contractors involved at all stages of waste management in the modern healthcare setting”

Written by the NHSScotland Waste Management Steering Group. Member names and job titles are not provided.

Endorsed by SEPA.

A disclaimer is provided stating that the guidance is “general” and accurate at time of publication.

Assessment of evidence
Training and audit requirements are also described in chapters 14 and 15 respectively but are out-with the remit of this review. Systems to promote “successful” segregation of waste are described, including “appropriate equipment”: • receptacles should be placed according to “requirements of work practice” • receptacles should be placed “as close to the point of waste production as possible”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Government of Canada. Infection prevention and control measures for Ebola disease in acute care settings. 2023 [cited 07 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This guidance addresses placement of receptacles for waste from EVD patient care. Aim: “guidance on the minimum level of IPC measures in healthcare settings in the event that a person under investigation for EBOD or patient with EVOD is identified within a Canadian healthcare facility” Appendix C in this Governmental guidance covers management of waste associated with suspected and confirmed cases of Ebola. Guidance is relevant to “facility and medical” waste management personnel, IPC, occupational health and safety and HCW educators and					

Assessment of evidence
“environmental services personnel” who may manage Ebola-associated waste in Canada. Evidence used for development is stated as “currently available scientific evidence, standards and regulations” with consideration of gaps or inconclusive research where appropriate. This guidance should be updated in line with emerging evidence. This document does not include care and management of the deceased. General guidance • Wear appropriate PPE. • “Remove the bag from the container (Note: this container should stay in the patient's room until discharge and relined with a new biohazard bag for next fill)” **Limitations** • A dedicated reference list for Appendix C is not provided and in-text citations are not used so it is unclear how evidence informed above guidance. • Reference list mainly contains guidance and other grey literature specific to Canadian healthcare settings, so the guidance did not consider primary literature. • This guidance presents minimum infection prevention and control measures for acute Canadian healthcare facilities. The authors state that these guidelines were developed based on Canadian settings so applicability to Scottish settings may be limited. • Much of the references are CDC and WHO but in text citations are not used so it is not clear where CDC/WHO citations has contribute to this guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 Guidance for employers and employees. 2013 [cited 08 November 2023]	Guidance for legislation	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance supports compliance with legislation which addresses placement of sharps containers.

Aim: Assist understanding of “legal obligations under the Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 (the Sharps Regulations)”, implementing the European Council Directive 2010/32/EU (the Sharps Directive) in UK legislation.

Target audience: “healthcare employers and employees”

“Place secure containers and instructions for safe disposal of medical sharps close to the work area – regulation 5(1)(d)”

“Regulation 7(6)(c) of COSHH requires systems to dispose of contaminated waste safely. The Sharps Regulations supplement this by requiring that clearly marked and secure containers be placed close to the areas where medical sharps are used. Instructions for staff on safe disposal of sharps must also be placed in those areas.”

Assessment of evidence
Sharps bins should be placed next to the healthcare worker in healthcare facilities. However, where this is not possible (examples of paramedics or home care are provided), a risk assessment by the employer should determine what sharps are used, “safe working procedures”, portable sharps containers to be used, and how these should be collected and replaced. Training and incident reporting requirements are also described.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. Avoiding sharps injuries - Blood borne viruses (BBV). n.d. [cited 08 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This HSE guidance supports compliance with legislation governing placement of sharps containers. This guidance is present on the HSE webpage under the blood borne viruses topic. Intended audience, intended users, authors, year of publication and development methods are not reported. This guidance is applicable to the UK. • Sharps containers should not be placed on the floor, window sills or above shoulder height and should instead be above knee and below shoulder height.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Public Health Agency of Canada. Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings. 2017 [cited 07 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This Canadian guidance addresses placement of waste receptacles and sharps containers for routine practice in healthcare.

Canadian Government guidance outlining “routine” and “additional” IPC healthcare practices and modifications to these practices for all healthcare settings. Designed for use by IPC professionals, to develop specific recommendations for local use. Revision from last version. Developed with a working group of varied backgrounds relevant to IPC but methodology isn’t reported. Based on research findings “wherever possible” with consensus by experts in the field filling in the gaps.

- Enough no-touch waste receptables should be accessible/convenient for disposal of paper towels, tissues, masks, gloves etc. in healthcare settings
- “conveniently located”; biomedical waste bags should be “impervious”
- sharps containers should be puncture resistant and located at point of waste production.

Evidence from previous update(s):

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Institute for Health and Care Excellence (NICE). Healthcare-associated infections: prevention and control in primary and community care. 2012 [updated 2017]	Guideline	**AGREE II Recommend**	N/A	N/A	N/A

Assessment of evidence

This NICE guideline makes specific recommendations regarding placement of sharps containers in primary and community care.

These guidelines aim to provide standard healthcare-associated infection prevention and control guidelines for healthcare workers working in primary and community care settings.

Systematic literature searches were run, with most recent searches for the 2012 update carried out on 18 April 2011 on MEDLINE, Embase, CINAHL and The Cochrane Library. Titles and abstracts of identified papers were screened by a research fellow and full papers were compared to inclusion/exclusion criteria so that studies relevant to the research questions could be appraised. Clinical findings informed recommendations. However, where clinical evidence was lacking or poor quality, the guideline development group provided input. There was an external review process as part of the guidelines' validation process.

In chapter 4 (Guideline summary), key priorities are highlighted, including:

Assessment of evidence

- "Everyone involved in providing care should be: trained in hand decontamination, the use of personal protective equipment, and the safe use and disposal of sharps." [2012]
- "Wherever care is delivered, healthcare workers must have appropriate supplies of: sharps containers" [new 2012]
- It is stated that at the time of publication in 2012, this recommendation was required for compliance with the following health and safety legislation: "Health and Safety at Work Act 1974, Management of Health and Safety at Work Regulations 1999, Health and Safety Regulations 2002, Control of Substances Hazardous to Health Regulations 2002, Personal Protective Equipment Regulations 2002, and Health and Social Care Act 2008"

In chapter 8 ("Standard principles for the safe use and disposal of sharps"):

- The following guidance on safe sharps disposal was updated in line with legislation:
    - "Sharps containers:
    - Must be located in a safe position that avoids spillage, is at a height that allows the safe disposal of sharps, is away from public access areas and is out of the reach of children" [new 2012]
    - The authors signpost to an old version of the HTM 07-01 for this recommendation

Limitations

- One major limitation is that it is not clear how many researchers contributed to the systematic literature searches.
- It is stated that, as of 2017, the guideline has been transferred to the "static list", but it is not clear what this is as the hyperlink to the static list does not work.
- The safe disposal of waste chapter has not been included in this AGREE appraisal as the authors state that "A literature search was not performed for these questions as the objective was to review and update the current recommendations about the safe disposal of personal protective equipment and safe disposal of sharps in line with patient care and with the European Union (EU) and national legislations. The Department of Health guidance; Safe Management of Healthcare Waste version 1.072 was reviewed." This DoH document is now out of date and has been captured elsewhere in the review.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Sunley K, Gallagher R, Reidy MP, et al. Essential Practice for Infection Prevention and Control - Guidance for nursing staff. London: Royal College of Nursing, 2017	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This RCN guidance provides specific best practice points regarding placement of sharps containers in UK health and care settings.

This document produced by the Royal College of Nursing is practice guidance based on evidence-based consensus to influence care decisions, with a focus on good infection prevention and control practices.

Under “Safe handling and disposal of sharps”:

Sharps are defined as encapsulating “needles, scalpels, stitch cutters, glass ampoules, bone fragments and any sharp instrument”, presenting risk of blood borne virus if a sharps injury occurs. An example of sharps injuries from sharps being put in waste bins is provided. Therefore, sharps should be disposed of safely according to local policy.

As such, the authors provide “best practice points” for sharps use:

- Sharps containers should be placed close to point of production e.g. sharps trays with integrated sharps boxes
- Sharps containers should be at eye level and “within arms’ reach”

Assessment of evidence
• Sharps bins should not be accessible from the public and out of children's reach **Limitations** • This document was due to be updated in November 2020 but has not been.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Sehulster L, Chinn RY; CDC; HICPAC. Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). MMWR Recomm Rep. 2003;52(RR-10):1-42.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This CDC guidance makes a specific recommendation regrading placement of sharps bins in health and care settings. The aim of this document was to provide evidence-based environmental infection control guidance for prevention of “environmentally mediated infections, particularly among health-care workers and immunocompromised patients”. Studies included were outbreak studies (considering “environmental opportunistic microorganisms and epidemiological- or laboratory experimental studies”) and organisational standards and guidelines, supplemented by expert opinion where there was insufficient evidence. Although literature searches were carried out, there was not enough evidence to deduce that methods were systematic, so this guidance was graded as Level 4. Recommendations for handling, transporting and storing “regulated medical wastes”: • “Place disposable syringes with needles, including sterile sharps that are being discarded, scalpel blades, and other sharp items into puncture-resistant containers located as close as practical to the point of use” – Category IC Note – in the appendices the authors signpost to an external source on regulated medical wastes in the U.S, where it is stated that (regulated) medical waste is “healthcare waste that that may be contaminated by blood, body fluids or other potentially infectious materials”.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Health and Safety (Sharp Instruments in Healthcare) Regulations 2013. 2013 [cited 03 October 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation addresses placement of sharps containers. In the Explanatory Note, it states that “Regulation 5 concerns the use and disposal of medical sharps – in particular, it provides that the use of medical sharps should be avoided so far as is possible, otherwise that ‘safer sharps’ are used where possible. It prohibits the practice of ‘re-capping’ except where required to control risk and where the risk to the employee is controlled by means of special equipment”. In relation to sharps disposal, Regulation 5 states that “(d) in relation to the safe disposal of medical sharps that are not designed for re-use— (i) written instructions for employees, and (ii) clearly marked and secure containers, are located close to areas where medical sharps are used at work.”					

Question 6: How should different waste bags/receptacles be filled and sealed in health and care settings?

Evidence added to Literature Review V5.0

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Control and Prevention. Procedures for Safe Handling and Management of Ebola-Associated Waste. 2022 [cited 08 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
The CDC provide guidance regrading how waste bags containing waste from EVD/MVD patients should be filled and sealed. This CDC guidance aims to provide detailed protocols to be read in conjunction with the CDC guidance on “Ebola-Associated Waste Management”. It is stated that this guidance is applicable to Ebola Disease and Marburg Virus Disease, and the page is currently being reviewed so the terminology used is true to this. Target audience: “Hospital infection control, occupational health systems, and facility medical waste managers and personnel” Under “Preparing a Waste Management Plan as Part of Ebola Patient Care”:					

Assessment of evidence
There should be a separate waste storage area for when patients are in triage awaiting Ebola confirmation. This storage space should be free from cutter, safe and adhere to fire codes. Specifically: • Do not over fill waste bags – advised to seal when two thirds full Under “Primary Packaging of Medical Wate in Patient’s Room”: Sharps containers should not be filled more than two thirds. The bag should be tied “with a method that will not tear or puncture the bag (e.g., tying the neck of bag with a goose-neck knot) and will ensure no leaks” Under “Secondary Packaging and Removal of Waste”: For offsite inactivation – the authors signpost to U.S DOT Guidance and summarise, the liner should be closed with a zip tie or similar (see manufacturer’s recommendations) and the lid and packaging closed before being removed

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Government of Canada. Infection prevention and control measures for Ebola disease in acute care settings. 2023 [cited 07 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This Canadian Government guidance describes how waste bags containing EVD/MVD waste should be sealed. Aim: “guidance on the minimum level of IPC measures in healthcare settings in the event that a person under investigation for EBOD or patient with EVOD is identified within a Canadian healthcare facility” Appendix C in this Governmental guidance covers management of waste associated with suspected and confirmed cases of Ebola. Guidance is relevant to “facility and medical” waste management personnel, IPC, occupational health and safety and HCW educators and “environmental services personnel” who may manage Ebola-associated waste in Canada. Evidence used for development is stated as “currently available scientific evidence, standards and regulations” with consideration of gaps or inconclusive research where appropriate. This guidance should be updated in line with emerging evidence. This document does not include care and management of the deceased. • Waste bags should be securely sealed when two-thirds full (hazardous Ebola-associated waste) **Limitations** • A dedicated reference list for Appendix C is not provided and in-text citations are not used so it is unclear how evidence informed above guidance. • Reference list mainly contains guidance and other grey literature specific to Canadian healthcare settings, so the guidance did not consider primary literature. • This guidance presents minimum infection prevention and control measures for acute Canadian healthcare facilities. The authors state that these guidelines were developed based on Canadian settings so applicability to Scottish settings may be limited. • Much of the references are CDC and WHO but in text citations are not used so it is not clear where CDC/WHO citations has contributed to this guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Safe management of wastes from health-care activities, 2nd ed. 2014 [cited 15 September]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

The WHO describe how waste containers and bags should be filled and sealed prior to collection in health and care settings.

This WHO guidance provides guidance on safe handling and disposal of waste from health care globally, also addressing waste management options for developing countries. This second addition of 'The Blue Book' updates guidance from 2007.

This guidance comprises of expert opinion from "internal consultation and collaboration" at a conference in 2007, with peer-review of each chapter from experts worldwide. Names of those who contributed to the first edition are provided in appendix 1.

Target audience: "medical staff, health-care facility directors, ancillary health workers, infection-control officers and waste workers […] regulators, policy-makers, development organizations, voluntary groups, environmental bodies, environmental health practitioners, advisers, researchers and students"

Waste containers should be filled a maximum of three quarters before being sealed for collection. Plastic bags should not be stapled. Plastic bags can be sealed with a plastic tag or tie.

Limitations

- This guidance is from 2014 so some guidelines may be out of date

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
United Nations Economic Commission for Europe. Agreement Concerning the International Carriage of Dangerous Goods by Road. 2023 [cited 12 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence

This legislation is signposted in SHTN 03-01 and HTM 07-01 as applicable to packaging in UK health and care settings (see below entries).

Known as the 'ADR', this international legislation governs transportation of dangerous goods: "According to article 2 of the Agreement, dangerous goods barred from carriage by Annex A shall not be accepted for international transport, while international transport of other dangerous goods shall be authorized subject to compliance with:

- the conditions laid down in Annex A for the goods in question, in particular as regards their packaging and labelling; and
- the conditions laid down in Annex B, in particular as regards the construction, equipment and operation of the vehicle carrying the goods in question."

Chapter 3.2 contains the "Dangerous goods list" (Table A):

Assessment of evidence
• UN No. 2814 – infectious substance affecting humans • UN No. 2814 – infectious substance affecting humans, in refrigerated liquid nitrogen • UN No. 2814 – infectious substance affecting humans (animal material only) Where Annex A provides “General provisions and provisions concerning dangerous substances and articles” including: • packaging and tank provisions (part 4) • consignment procedures including marking and labelling (part 5) • packaging requirements (part 6)

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Gallagher R, Cameron L and Sunley K. Sharps safety. RCN guidance for the prevention and management of sharps injuries in health and social care settings. 2023 [cited 19 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
The RCN provide guidance regarding how full sharps containers should be before closure, with no supporting citations provided. The RCN is a UK union and professional body for nursing. This guidance document was made in association with “The RCN UK Safety Representatives’ Committee Rose Gallagher, RCN Professional Lead for Infection Prevention and Control, Leona Cameron, RCN Head of Health, Safety and Wellbeing, Kim Sunley, Health, Safety and Wellbeing National Officer.” The guidance is “intended for use in the UK” but can be extrapolated for other countries where appropriate. Information is said to be “compiled from professional sources, but its accuracy is not guaranteed.”. Under the heading “Work practice controls”, the following examples are provided regarding controls that can be in place to reduce the risk of occupational hazards: • Seal and discard of single-use sharps containers when 3/4 full. • “Exchange reusable sharps containers when the overfill protection (if fitted) is activated.” References provided at the end of the document, alongside other resources. **Limitations** • No methodology or development process is reported nor are member names and affiliations involved in development of this guidance. • No strength of recommendations provided based on available evidence. • Unclear whether evidence has been graded for use in these guidelines.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Institute for Health and Care Excellence (NICE) and Social Care Institute for Excellence SCIE). Helping to prevent infection A quick guide for managers and staff in care homes. n.d. [cited 19 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This NICE guidance is to be read in conjunction with the Department of Health's code of practice for IPC in care homes. Sharps should be placed in the correct container at point of production, and sharps containers should be disposed of when they are filled to the fill line.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health & Social Care. Infection prevention and control: resource for adult social care. 2022 [cited 20 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This UK guidance addresses filling and sealing of waste bags and sharps containers in adult social care settings.

This guidance outlines IPC principles for preventing and managing infections in adult social care, where adult social care covers activities helping the elderly, those living with disabilities or physical/mental illness out-with NHS services, unpaid carers included. This guidance is based off information from NICE, NHS, government departments and other professional regulatory bodies, but Care Quality Commission providers should also comply with those regulations and Code of Practice.

Target audience: “those responsible for setting and maintaining standards of IPC within adult social care in England”

Limitation

- Please note that Appendix 1 contains links for “further information” including the NIPCM waste review (link broken). Since references are not provided, it is not clear if this was one of the documents which informed this guidance

Waste bags should not be filled more than three-quarters before being tied.

Sharps containers should not be filled past the fill line.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Health and Medical Research Council. Australian Guidelines for the Prevention and Control of Infection in Healthcare. 2019 [cited 20 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This Australian guidance provides a specific good practice statement regarding how sharps containers should be filled.

These Australian guidelines are nationally accepted for IPC “core principles and priority areas for action” with the intent to guide development of protocols and processes. The intended audience is healthcare workers and healthcare facilities. The guidance is “underpinned by a risk-management framework to ensure the basic principles of infection prevention and control can be applied to a wide range of healthcare settings including hospitals, day procedure units, office-based practice, long-term care facilities, remote area health services, home and community nursing and emergency services”. Risk assessments should guide application at facility level. The evidence base mainly surrounded high risk and acute settings.

The following Good Practice statement is provided regarding using and managing sharps and associated devices:

- Sharps containers:
    - “must not be filled above the mark that indicates the maximum fill level.”

Assessment of evidence
The authors stated that this good practice statement is based on “sound theoretical principles” and supported by expert opinion. Legislation should also be consulted.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Standards New Zealand. Management of Healthcare Waste. 2002 [cited 22 September 2023]	Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Specific requirements for filling and sealing healthcare waste bags are described. This New Zealand standard contains best practice guidance (beyond legislative requirements) on human and animal healthcare waste disposal including classification, segregation, packaging/containment, labelling, storage and transport, where healthcare waste refers to all waste produced by a healthcare facility. These standards aim to assist compliance with regulations and best practice in healthcare waste management. Guidance for compliance with NZ legislation It is stated that waste bags for healthcare waste (except sharps) should: • Not be filled more than two-thirds • Securely close when filled two-thirds • Not require sharp instruments like staples to close

Assessment of evidence
Limitations • From 2002 so may not be reflective of current best practice • How best practice determined not clear

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
U.S. Food & Drug Administration. Sharps Disposal Containers in Health Care Facilities 2021 [cited 27 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This guidance addresses how sharps containers used in health facilities should be filled and sealed. The US FDA provide guidance for sharps disposal containers to be used in US health facilities. Sharps disposal containers are described as “made from rigid puncture-resistant plastic or metal with leak-resistant sides and bottom, and a tight-fitting, puncture-resistant lid with an opening to accommodate depositing a sharp but not large enough for a hand to enter” (“generally” regulated by FDA as class II devices). The authors also define sharps. Sharps disposal containers should have a line to indicate three-quarters full. They should be closed and sealed according to manufacturer’s instructions when they are three-quarters full.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England. Health Technical Memorandum 07-01: Safe and sustainable management of healthcare waste. 2022 [cited 23 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

HTM 07-01 addresses how waste should be packaged in accordance with relevant legislation, and how waste bags should be sealed in primary care.

Health technical memoranda are described as “comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology” for healthcare delivery. This guidance targets safe and sustainable management of healthcare waste for all NHS Trusts, and laboratories and vet surgeries.

it is stated that this best practice guidance is not mandatory unless stated. Where authors have used this wording is indicated in the ETs by “”s. The authors provide the following guidance on these choices of wording:

- “must” for legal compliance
- “should” for a recommendation that is not mandatory
- “may” for permission

This guidance replaces the 2013 version, with the aim of supporting compliance with legislative changes and better capturing sustainability goals including the NHS Clinical Waste Strategy.

Assessment of evidence
A list of contributors is provided, and a statement thanking those from the “scoping and technical engagement phases” indicating a consultation phase but not much detail is provided on how this guidance was formed, including no indication of systematic methods. Target audience: those involved in NHS waste management (details on relevant sections by job role are signposted in Table 1, p.4), targeted towards compliance with English legislation and regulations so should not be “relied upon” by devolved nations. To comply with English legislation, the following guidance is provided for handling clinical waste, bags should not be over filled (up to two-thirds full) The following transport and packaging guidance is provided for compliance with English legislation: • Bulk transport of UN 3291 waste for waste in packages should be encouraged over waste in large packaging for logistical and environmental impact purposes Best Practice examples for sealing waste bags in primary care: • “No more than two-thirds full so the bag can be tied securely” • ““Swan necked” (neck of bag twisted, bent in half, and fastened)” • “Securely tied using a plastic tie or secure knot” Waste to be transported “should” be securely packaged as per ADR. **Limitations** • The Welsh HTM 07-01 is based on the old 2013 HTM 07-01. However, this current version is also linked out in NHS Wales web pages, so it is not clear if Welsh NHS boards are also to follow this guidance. • Unclear methodology and inconsistent in text citations used.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland Waste Management Guidance: Scottish Health Technical Note 03-01. Version 7.0. 2023 [updated 09 December 2024; cited 02 November 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

SHTN 03-01 addresses how waste should be packaged in accordance with relevant legislation, and how waste bags should be sealed in Scottish health and care settings.

This guidance aims to help boards in NHSScotland meet waste management legal, policy, procedural requirements and best practice in Scotland, applicable to NHSScotland healthcare services producing waste, superseding the SHTN 03-01 Parts A to D. It is stated that NHSScotland staff and contractors should not rely on the HTM 07-01 or UK-wide waste management guidance alone due to differing legal requirements across the UK.

Target audience: “staff and contractors involved at all stages of waste management in the modern healthcare setting”

Written by the NHSScotland Waste Management Steering Group. Member names and job titles are not provided.

Endorsed by SEPA.

Assessment of evidence
A disclaimer is provided stating that the guidance is “general” and accurate at time of publication. Training and audit requirements are also described in chapters 14 and 15 respectively but are out-with the remit of this review. Systems to promote “successful” segregation of waste are described, including “appropriate equipment”: • receptacles and sacks “should be placed when three-quarters full” • the authors recommend “plastic tie closures” for healthcare waste sacks “Once the UN number of a substance is known, international carriage by road (ADR) provides information on the packing group, packing instruction and any special packing provisions (including any restrictions applying to mixed packaging) that apply.” Examples of these for healthcare wastes are provided in Table 6.1, where Category A waste should have “Three-part packaging” and Category B waste should have “Rigid packaged or back in wheeled bins”, “Bulk approved bags may be used in combination with BK2 approved containers or vehicles”. Only UN-tested and approved packaging should be used for packaging instructions. Examples of UN marks for such approved packages are provided in Figures 6.1 and 6.2. UN-approved containers can be a package (“container with a capacity smaller than that of either a large Package or an Intermediate Bulk Container”, large package (“an outer package that contains articles or inner packaging with a minimum capacity of 400Kg net weight or 450 Litres. The total volume should not exceed 3 M^3”), and intermediate bulk container (“rigid or flexible package that has a capacity of not more than 3 M^3 and is designed for mechanical handling”) Packaging requirements for solid surgical instruments, used linen, waste medicines, and radioactive material are described. Incidents of damaged packages should be investigated.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Government Department of Health. Health Building Note 03-01: Adult acute mental health units. 2013 [cited 07 August 2024]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This guidance requires that equipment in inpatient mental health units in the UK should be anti-ligature as well as meeting the relevant IPC requirements (considered in this research question in the context of ensuring replacement waste receptacles are available). This UK guidance focuses on best practice design of inpatient mental health units for adults. “All furniture and fittings are required to be robust, anti-ligature, prevent opportunities for concealment and meet infection control requirements, while being as domestic in style as possible and not offering opportunities for easy lifting or breakage. This is particularly important in rooms where service users are unsupervised, such as the bedrooms and en-suites.”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Care Quality Commission and Mental Health and Learning Disability Nurse Directors Forum. Reducing harm from ligatures in mental health wards and wards for people with a learning disability. 2023 [cited 07 August 2024]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This UK guidance supports risk assessment to determine availability of items available in mental health wards and wards with patients with learning disabilities (considered in this research question in the context of ensuring replacement waste receptacles are available). This guidance focuses on addressing ligature risks for patients in mental health wards and wards with patients with learning disabilities. Target audience: staff of mental health wards and caring for those with learning disabilities, those risk assessing inpatient care and those responsible for procuring, installing and maintaining fixtures and fittings in these settings. A ligature is defined as “anything, like a cord or other material, that could be used for the purpose of hanging or strangulation”. “Most items are not dangerous in everyday use and, as a result, services should avoid taking a blanket approach to restrict items associated with ligatures risks. Individual risk assessments (discussed below) should be carried out to determine the extent to which items that are capable of being used for self-harm are removed from the patient. This should be regularly reviewed and monitored.”					

Evidence from previous update(s):

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Sunley K, Gallagher R, Reidy MP, et al. Essential Practice for Infection Prevention and Control - Guidance for nursing staff. London: Royal College of Nursing, 2017	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance provides a specific best practice point regarding maximum capacity of sharps containers.

This document produced by the Royal College of Nursing is practice guidance based on evidence-based consensus to influence care decisions, with a focus on good infection prevention and control practices.

Under “Safe handling and disposal of sharps”:

The authors provide “best practice points” for sharps use:

- Sharps containers should not be filled more than two thirds or to the fill line

Limitations

- This document was due to be updated in November 2020 but has not been

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health and Health Protection Agency. Prevention and control of infection in care homes – an information resource. 2013 [cited 03 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This guidance details protocols for filling and sealing waste bags in UK care homes.

Best practice infection prevention and control guidance for staff caring for residents in care homes in England and should be read in conjunction with "The Health and Social Care Act 2008: Code of Practice on the prevention and control of infections and related guidance". The authors state that not all of the guidance will be applicable to all care homes.

Target audience: "Care Trust CEs, GPs, Communications Leads, Consultants in Communicable Disease Control, Community Infection Control Nurses, Health Protection Nurses, Care Home Managers, Care Quality Commission"

Under Part 3 that addresses "Basic infection prevention and control practices" i.e. Protocols that should be applied by all care workers at all times to reduce likelihood of infection:

- It is good practice to use the 'swan neck' technique to seal receptacles ("twisting the top and then turning it over on itself") – an overhand knot should not be used
- Tape and a tie should be used to secure the bag shut
- The waste bag should not be more than three quarters full

Assessment of evidence
Limitations • For waste management, the bibliography references the DoH Safe management of healthcare waste guidance which is now archived

Question 7: How should special (hazardous) waste (including sharps, blood and body fluids) be handled in health and care settings?

Evidence added to Literature Review V5.0

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
European Centre for Disease Prevention and Control (ECDC). Considerations for infection prevention and control practices in relation to respiratory viral infections in healthcare settings. 2023 [updated 09 February 2023; cited 29 August 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This ECDC guidance addresses wearing PPE when handling infectious waste in the context of respiratory viral infections in hospitals. This ECDC document is aimed at supporting guideline development for infection prevention and control for respiratory tract viral infection patient management for European Union/European Economic Area healthcare providers and facilities. Target audience: “National public health agencies, healthcare facility administrators, IPC and other professionals developing relevant IPC guidance and healthcare workers in EU/EEA countries” It is stated that staff involved in waste management should be trained and provided with “appropriate PPE”, however, it is not stated what PPE this is (PPE described is only for healthcare workers caring for respiratory viral infection patients). Referencing WHO guidance on Transport of Infectious Substances, the authors state that waste should be categorised as “infectious clinical waste Category B (UN3291)” and handled accordingly, subject to healthcare facility policy and local regulations.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
European Centre for Disease Prevention and Control (ECDC). Infection prevention and control and preparedness for COVID-19 in healthcare settings. Sixth update – 9 February 2021.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
2021 [updated 09 February 2021; cited 29 August 2023					

Assessment of evidence

This ECDC guidance describes specific items of PPE to be worn while handling waste in acute care and long term care facilities to reduce the risk of COVID-19 transmission.

This ECDC guidance document aims to provide guidance on infection prevention and control measures required for managing possible and confirmed cases of COVID-19 in healthcare settings and long-term care facilities in the European Union/European Economic Area and the United Kingdom.

Target audience: “National public health agencies, hospital administrators, LTCF administrators and healthcare workers in EU/EEA countries and the United Kingdom (UK)”

For acute care settings and long-term care facilities, to reduce the risk of COVID-19 transmission from environmental contamination:

- Those handling waste should be “appropriately trained” and receive sufficient instructions
- Staff should wear “a medical face mask, eye protection (visor or goggles), gloves and a gown” (WHO COVID-19 PPE interim guidance from February 2020 is referenced, now superseded by the December publication)
- Those involved in waste management should be given and wear “appropriate PPE”

Limitations

- This document was published in 2021 so may not be reflective of guidance for managing COVID-19 in healthcare settings now that the pandemic is over
- Some references have now been superseded

Assessment of evidence
• Relies heavily on two references by WHO – Rational use of personal protective equipment for coronavirus disease 2019 (COVID-19) and Guidance on regulations for the Transport of Infectious Substances 2013–2014

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
European Centre for Disease Prevention and Control (ECDC). Safe use of personal protective equipment in the treatment of infectious diseases of high consequence: A tutorial for trainers in healthcare settings. 2014 [updated 03 December 2014; cited 29 August 2014]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This ECDC guidance describes specific items of PPE to be worn while handling HCID-contaminated waste. Considerations for liquid waste disposal are also described.					

Assessment of evidence

This ECDC tutorial aims to contribute to better hospital preparedness in Europe by addressing technical requirements for PPE for HCID, critical aspects of these ensembles, protection beyond PPE and occupational safety and health. This document was developed by ECDC and external experts, addressing documents on PPE for Ebola patient care (from international and European organisations) and guidelines and training materials from the WHO, US CDC and Medicins sans Frontieres.

Target audience: Mainly “future PPE instructors with a background in infection control and hygiene in hospital settings” and “professionals in communicable diseases, infection control and hospital hygiene experts, hospital managers in charge of administration, nursing, OSH and emergency planning [; …] experts in preparedness at the regional and national levels”

Table 1 states that heavy duty gloves should be used for waste management.

For waste management, inner gloves should be underneath “rough outer working gloves”. Inner gloves are described as “a glove of intermediate thickness”, and extended cuffs/longer sleeves are preferable to aid changing gloves.

PPE components should not be adjusted during waste management.

WHO five moments for hand hygiene should be adhered to for waste management.

“Linen and any equipment contaminated with bodily fluids should be placed in impermeable, clearly labelled bags and processed according to procedures for highly infectious waste.” Appropriate procedures for HCID waste management should be in place.

Under “Considerations on barrier management”, the authors state:

- Liquid waste like vomit, urine and diarrhoea should only be disposed of in sanitary sewers “if the pathogen in question would allow such procedure”. Otherwise, body fluids should be collected with tissues or nappies and disposed of with other waste
- An extra pair of heavy-duty gloves may be used when handling highly infectious waste, and impermeable apron and rubber boots can also be “useful”

Limitations

- Described as a living document but no updates past 2014 recorded.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Association for Professionals in Infection Control and Epidemiology (APIC). Procedural Guidance on the Proper Packaging of Ebola Suspected Waste/ Department Of Transportation Guidance for Preparing Packages of Ebola Contaminated Waste for Transportation and Disposal. n.d. [cited 07 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This CDC guidance describes specific steps for managing Ebola-contaminated waste for compliance with US legislation. This US Guidance describes how to package waste contaminated with suspected or confirmed Ebola for transportation in accordance with the US Department of Transportation's Hazardous Materials Regulations for transporting Category A infectious substances.					

Assessment of evidence

This guidance is intended for those who package waste contaminated with suspected/confirmed Ebola.

The following steps are described for preparing the triple-bagged waste package:

1. The contaminated waste should be placed into a plastic bag and treated with EPA-registered hospital disinfectant for non-enveloped viruses (CDC recommended for use for Ebola) before sealing. Sharps should still be placed in specific sharps containers and closed and sealed according to manufacturer instructions. Objects with sharp edges should be wrapped so that they do not puncture the plastic bag. “Close the plastic film bag by tying the bag with a knot or other equally effective positive means of closure that will not tear or puncture the outer bag or liner such as heat sealing, tape, or adhesive, and will ensure any liquid contents will not leak from the packaging”. The surface of the plastic bag should also be disinfected with EPA-registered hospital disinfectant as described above.
2. This sealed plastic bag should then be placed into a second plastic bag with the knot facing up. “Close the second plastic film bag by tying the bag with a knot or other equally effective positive means of closure that will not tear or puncture the outer bag or liner such as heat sealing, tape, or adhesive, and will ensure any liquid contents will not leak from the packaging” without the first bag getting in the way. The surface of the plastic bag should also be disinfected with EPA-registered hospital disinfectant as described above.
3. Outer packaging should be rigid UN standard or DOT approved “non-bulk packaging”. Absorbent material should be placed in the bottom or lining of the outer packaging to capture any liquid waste. The double bagged waste should be placed in this rigid packaging, or in the outer fiberboard outer packaging “with an installed liner” which is then closed with a zip tie or similar (see manufacturer specifications). The outer packaging should be closed according to manufacturer instructions. The outer surface should then also be disinfected with EPA-registered hospital disinfectant as described above.

Outer packaging should be kept closed except when the outer package is being filled with inner packages.

Limitations

- Author not clear – accessed from APIC website
- Applicable for compliance with US legislation

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Control and Prevention. Procedures for Safe Handling and Management of Ebola-Associated Waste. 2022 [cited 08 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This CDC guidance provides specific steps and considerations for managing Ebola-contaminated waste, including liquid waste management,

This CDC guidance aims to provide detailed protocols to be read in conjunction with the CDC guidance on “Ebola-Associated Waste Management”. It is stated that this guidance is applicable to Ebola Disease and Marburg Virus Disease, and the page is currently being reviewed so the terminology used is true to this. Of the CDC guidance on Ebola waste, this is the most detailed and the other documents contain a lot of duplicated information.

Target audience: “Hospital infection control, occupational health systems, and facility medical waste managers and personnel”

“Key principles” for Ebola waste management are described:

1. Waste should be contained and packaged as close to point of production as possible. Waste containers should not be re-opened following this waste being contained.
2. Number of those handling Ebola waste should be limited (before and after it has been contained).

Assessment of evidence
3. “Appropriate” PPE and procedures should be used when handling Ebola waste until it has been inactivated. Under “Preparing a Waste Management Plan as Part of Ebola Patient Care”: Ebola waste should be handled, stored, treated and disposed of according to local regulations. Those involved in waste management should have training on waste handling and PPE. Under “Primary Packaging of Medical Waste in Patient’s Room”: The authors link out the CDC’s interim Ebola virus guidance for guidance on solid waste management e.g. medical equipment, used PPE, cleaning byproducts etc. Receptacles like sharps containers and primary packaging (double-bagged waste) should be placed in the patients’ room by a healthcare worker wearing appropriate PPE. Among the steps provided regarding primary packaging: • No liquid should be added to waste that is going to be inactivated offsite • Sharps containers should be placed in a biohazard bag • EPA-registered hospital disinfectant from a CDC list should be used to clean the outside of the sealed bag • The second biohazard bag should also be sealed and disinfected with hospital cleaner meeting the same standards • Disinfected sealed receptacles should be kept in a designated waiting area before being removed • Visibly contaminated PPE should be disinfected and removed following recommendations Under “Secondary Packaging and Removal of Waste”:

Assessment of evidence
Among the steps provided include the following: • The HCW caring for the Ebola patient and wearing PPE as specified in local guidance should disinfect the outside of double-bagged waste from primary packaging steps with EPA-registered hospital cleaner before removing the waste from the patients' room • This container should be placed in the outer edge of the PPE doffing area to avoid re-contamination • Only the cart or "outer container" should be handled, and the outer container should never be opened. PPE worn is specified in OSHA guidance (see ET entry below) Under "Procedures for Handling Liquid Wate (Body Fluids Including Blood, Urine, Vomit, Feces)": Local regulations should specify "pretreatment" requirements. The following steps are provided: 1. Liquid waste should be handled in patient rooms by those caring for the Ebola patient, wearing PPE specified by hospital guidance 2. The waste should be poured into a toilet at a low level avoiding splash 3. The toilet lid should be closed before being flushed 4. The flush handle, toilet seat and lid should be disinfected with EPA-registered hospital disinfectant (see CDC lists) 5. Cleaning cloths should be disposed of in biohazard bags 6. Vomit and "portable toileting containers" should be disposed of as solid waste 7. Visibly soiled PPE should be disinfected and removed according to recommendations Steps for handling blood and infectious material spills are provided according to OSHA guidance – it is not specified if this is referring to waste or body fluids so has not been added to ET 11.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Occupational Safety and Health Administration. PPE Selection Matrix for Occupational Exposure to Ebola Virus. 2014 [cited 08 September 2023] Accessed 08 September 2023.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Specific PPE ensembles for managing Ebola-contaminated waste are described. Supporting references are not provided.

This OSHA guidance is intended to assist employers in choosing the correct PPE for employees at risk of exposure to Ebola based on activity and level of risk. PPE selections are based off of OSHA and CDC guidance. This guidance is not intended to be exhaustive of all PPE bundle options for all exposures, but to provide examples to assist employer decisions.

For employees handling, transporting, treating and disposing of suspected/confirmed Ebola waste that has been packaged at point of production, the following is recommended:

- “Typical precautions/PPE”
- Dedicated clothes e.g. uniforms, scrubs, shoes
- Puncture resistant nitrile heavy-duty gloves

Assessment of evidence
• Face mask (where exposure risk is high) • Eye and face protection e.g. shield and goggles • Fluid-resistant gown (where exposure risk is high) • Fluid-resistant coveralls (where exposure risk is high) • Fluid-resistant boot covers covering lower leg (where exposure risk is high) For employees handling, transporting, treating and disposing of suspected/confirmed Ebola waste where the container is being re-opened or the waste is being “handled directly”, the following is recommended: • “Typical precautions/PPE” • Dedicated clothes e.g. uniform, scrubs, shoes • Puncture resistant nitrile heavy-duty gloves • Eye and face protection e.g. shield and goggles • Impermeable gown • Impermeable coveralls (where exposure risk is high) • Impermeable boot covers covering lower leg (where exposure risk is high) • Disposable N95 respirator • Elastomeric respirator (where exposure risk is high) • PAPR (where exposure risk is high)

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Government of Canada. Infection prevention and control measures for Ebola disease in acute care settings. 2023 [cited 07 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This Canadian guidance details requirements for managing Ebola-contaminated sharps and non-sharps waste.

Aim: “guidance on the minimum level of IPC measures in healthcare settings in the event that a person under investigation for EBOD or patient with EVOD is identified within a Canadian healthcare facility”

Appendix C in this Governmental guidance covers management of waste associated with suspected and confirmed cases of Ebola. Guidance is relevant to “facility and medical” waste management personnel, IPC, occupational health and safety and HCW educators and “environmental services personnel” who may manage Ebola-associated waste in Canada. Evidence used for development is stated as “currently available scientific evidence, standards and regulations” with consideration of gaps or inconclusive research where appropriate. This guidance should be updated in line with emerging evidence. This document does not include care and management of the deceased.

Ebola-associated waste should be considered biohazardous if contaminated with blood and body fluids, including linen and sharps, to prevent disease transmission. A more detailed list of waste examples is provided. This guidance is directed at healthcare settings where there is not onsite incineration or autoclaving facilities or alternatives to appropriately disinfect Ebola-associated biohazardous waste.

Assessment of evidence
General guidance • Limit the number of healthcare workers in contact with Ebola-associated waste. • Handle waste in the patient surroundings. • Wear appropriate PPE. • Waste containers should be securely sealed, identifiable as for biohazardous waste and be at next to or near PPE removal site. Human waste • Disposed of using patient toilet facilities – controlled pouring of waste close to toilet and flush with lid closed, then disinfect toilet fixtures and surfaces. A solidifier should be used for liquid waste for disposals where relevant local restrictions apply. • Specific measures do not apply where sewage disposal is on-site. Non-sharps waste • Consider all supplies taken into patient surroundings contaminated regardless of use. • Waste should be placed in a container with a biohazard bag resistant to leakage and tearing. Waste should not be compressed to fit into waste containers, and bags should be securely sealed when two-thirds full. Containers should not be re-opened. • Waste handling and containing should take place in the patient surroundings or PPE doffing area. • Remove sealed bags, decontaminate their outside surface and place within a second biohazard bag to be securely sealed, labelled, and outer surface decontaminated. Sharps • Handled independently of other waste, and disposed immediately after use into single-use sharps containers resistant to leaks and punctures with a secure closing mechanism. • Containers securely closed once two-thirds full and outside surface disinfected.

Assessment of evidence
• Place closed sharps container into a second container resistant to leaks and punctures, seal, label, and disinfect the outside surface. **Limitations** • A dedicated reference list for Appendix C is not provided and in-text citations are not used so it is unclear how evidence informed above guidance. • Reference list mainly contains guidance and other grey literature specific to Canadian healthcare settings, so the guidance did not consider primary literature. • This guidance presents minimum infection prevention and control measures for acute Canadian healthcare facilities. The authors state that these guidelines were developed based on Canadian settings so applicability to Scottish settings may be limited. • Much of the references are CDC and WHO but in text citations are not used so it is not clear where CDC/WHO citations has contribute to this guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. Avoiding sharps injuries - Blood borne viruses (BBV) n.d. [cited 08 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This HSE guidance contributes to the evidence base regarding safe sharps disposal. This guidance is present on the HSE webpage under the blood borne viruses topic. Intended audience, intended users, authors, year of publication and development methods are not reported. This guidance is applicable to the UK. • Sharps should be disposed of in sharps containers, and never placed inside a yellow waste bag. • "Do not try to press sharps down to make more room" [in the sharps disposal container] • Sharps containers should be carries away from the body, using the handle.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Safe management of wastes from health-care activities, 2nd ed. 2014 [cited 15 September]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This WHO guidance contributes to the evidence base for this research question regarding infectious, liquids and sharps waste, and PPE required for handling hazardous waste. This WHO guidance provides guidance on safe handling and disposal of waste from health care globally, also addressing waste management options for developing countries. This second addition of 'The Blue Book' updates guidance from 2007.					

Assessment of evidence
This guidance comprises of expert opinion from “internal consultation and collaboration” at a conference in 2007, with peer-review of each chapter from experts worldwide. Names of those who contributed to the first edition are provided in appendix 1. Target audience: “medical staff, health-care facility directors, ancillary health workers, infection-control officers and waste workers […] regulators, policy-makers, development organizations, voluntary groups, environmental bodies, environmental health practitioners, advisers, researchers and students” Sharps waste should be treated as if it is infectious as it is considered “highly hazardous”. Waste should be considered infectious if it’s possible that during its’ handling and disposal disease transmission could happen (see Chain of Infection). Those at risk from exposure to hazardous waste include “medical doctors, nurses, health-care auxiliaries and hospital maintenance personnel”; “patients in health-care facilities or receiving home care”; “visitors to health-care facilities”; “workers in support services, such as cleaners, people who work in laundries, porters”; “workers transporting waste to a treatment or disposal facility”; “workers in waste-management facilities (such as landfills or treatment plants), as well as informal recyclers (scavengers).” i.e. those working in healthcare facilities or handling healthcare waste and the general public when waste is mis-managed. Infectious waste should always be treated as if it is contaminated with pathogens since infectivity cannot be determined at point of production. Table 3.1. lists infections that can be caused from exposure to healthcare waste. Sharps are hazardous in two ways – they can cause injury as well as infection risk. Those handling waste should understand the risks and relevant procedures for the types of waste they’re handling. Highly infectious waste should be segregated and autoclaved at point of production, then can be removed from the medical area in an infectious healthcare waste container. Sharps waste should be placed in a sharps container. Some facilities remove needles from syringes and place them in puncture-proof containers, with syringes placed in infectious waste but this is not best practice.

Assessment of evidence

Further segregation of hazardous non-infectious waste is described.

General waste from patient care should be considered low risk unless a patient has a known communicable infection, wherein waste used for and around the patient should be considered infectious.

Waste from all patients in emergency situations should be considered as potentially infectious.

“Collected body fluids, small quantities of blood and rinsing liquids from theatres and intensive care can be discharged in the sewer without pretreatment.”

Sharps tend to pose the greatest infection risk to those handling healthcare waste, and non-sharp waste occupational exposure cases are rarely reported. The authors signpost to one example from a 1998 outbreak of TB from healthcare waste. Chemical exposure risk is also described. Table 11.2 lists hazards to healthcare workers from waste, with the following IPC risks highlighted:

- Exposure to BBV (hepatitis B, hepatitis C, HIV, malaria etc) through sharps injury. Control measures include immunisation against hepatitis B, sharps disposal into puncture-proof containers, no recapping of sharps, using needles engineered to “automatically retract, blunt resheath, or disable the sharp”
- Exposure to biological hazards like SARS, TB and influenza. Control measures include exhaust ventilations, SICPs, respiratory infection for high risk procedures (N95, FFP3 respirators), and autoclaving laboratory waste

Level of PPE worn will likely depend on risk associated with healthcare waste being handled, but PPE that should be available to all those collecting and handling healthcare waste include industrial aprons, coveralls and leg protectors and/or industrial boots. Medical workers should wear disposable gloves whereas waste workers should wear heavy-duty gloves. Dependent on “type of operation”, the following should also be made available: safety goggles, face masks and helmets with or without visors. Explicit guidelines on which PPE to be worn when are not provided. (Gloves should be provided as a minimum for protection against body fluids)

Needles should not be recapped after use as part of standard precautions.

Proper hand hygiene should be followed.

Assessment of evidence

In chapter 12 on “Hospital hygiene and infection control”, an aide memoire is provided for standard precautions (p.204-205). Waste management guidance is vague, stating that safe management of waste should be implemented, with single use items disposed of properly.

The following points should be covered in training for healthcare workers involved in waste management:

- “Great care should be taken if needles have to be removed from syringes.
- Hazardous and general waste should not be mixed. Segregation is the key to safe health-care waste management.
- No attempt should be made to correct waste-segregation mistakes by removing items from a bag or container, or by placing one bag into another of a different colour.
- Nursing and clinical staff should ensure that adequate numbers of bag holders and containers are provided for the collection, and subsequent onsite storage, of health-care waste in the medical areas, clinics, theatres and other areas where waste is generated. These receptacles should be located as close as practicable to the common sources of waste generation in a medical area.”

In training for cleaning staff, the following points should be addressed:

- “Check that waste-storage bags and containers are sealed. No bags should be removed unless properly labelled and securely sealed to prevent spillages.
- Bags should be picked up by the neck only. They should be put down in such a way that they can again be picked up by the neck for further handling. Manual handling of waste bags should be minimized whenever possible.
- Waste bins should be cleaned after removing the filled waste bag, and a new bag should be placed into the bin immediately.
- Waste bags should not touch the body during handling, and collectors should not attempt to carry too many bags at one time. No more than two is a sensible limit.
- When handling and transporting waste bags or containers is completed, seals should again be checked to ensure they are unbroken.

Assessment of evidence

- To avoid puncture or other damage, waste bags should not be thrown or dropped.
- Mismanagement of sharps waste may occasionally puncture the side or bottom of a polypropylene container; the container should therefore be carried by its handle and should not be supported underneath with the free hand.
- Bags for hazardous health-care waste and for general waste should not be mixed, but should be segregated throughout handling and transport. Hazardous waste should be placed only in specified storage areas.
- Appropriate cleaning and disinfection procedures should be followed in the event of accidental spillage. Any such incident should be reported immediately to the responsible member of staff.
- Protective clothing (gloves, apron, sturdy shoes) should be worn during all waste-handling operations.
- Raw food supplies such as vegetables and fruits should not to be unloaded or stored near waste-storage areas."

Limitations

- This guidance is from 2014 so some guidelines may be out of date.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health & Social Care. Infection prevention and control: resource for adult social care. 2022 [cited 20 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This UK adult social care guidance describes sharps waste disposal and hand hygiene following waste handling. This guidance outlines IPC principles for preventing and managing infections in adult social care, where adult social care covers activities helping the elderly, those living with disabilities or physical/mental illness out-with NHS services, unpaid carers included. This guidance is based off information from NICE, NHS, government departments and other professional regulatory bodies, but Care Quality Commission providers should also comply with those regulations and Code of Practice. Target audience: “those responsible for setting and maintaining standards of IPC within adult social care in England” Infectious waste streams should only be used when necessary. Sharps waste should be disposed of in a sharps box, with systems in place to minimise sharps exposure and injury. The following guidance is provided: • Needles for disposal in a sharps container should not be bent, broken, dissembled or recapped • Sharps should not be placed in waste bags Hand hygiene should be performed after handling waste **Limitation** • Please note that Appendix 1 contains links for “further information” including the NIPCM waste review (link broken). Since references are not provided, it is not clear if this was one of the documents which informed this guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Infection prevention and control of epidemic- and pandemic-prone acute respiratory infections in health care. 2014 [cited 21 September 2023]	Guideline	**AGREE II Recommend with Modifications**	N/A	N/A	N/A

Assessment of evidence

This WHO guideline addresses liquid waste disposal in the context of epidemic- and pandemic-prone respiratory infections.

AGREE II Recommend with Modifications as per organisational criteria and completed critical appraisal.

Update of WHO interim guidelines of same name from 2007. Updates include learning and evidence associated with pandemic H1N1 virus and “influenza-like illness” following the 2009 pandemic and other relevant evidence updates as determined through targeted systematic review (Annex L). Where informed by new evidence, the GRADE tool was used for appraisal. The guideline aimed to provide: “recommendations and other information relating to IPC measures for ARIs in health-care settings, with specific emphasis on ARIs that have the potential for rapid spread and may cause epidemics or pandemics (or both)". Also covers standard precautions and baseline IPC expectations for preparedness. Intended users are “IPC professionals and members of IPC teams, health-care managers and policy-makers” as well as administrators. “The development of the guidelines followed the process established in the WHO handbook for guideline development, which involved active participation of the Global Infection Prevention and Control Network (GIPCN). The resulting recommendations were peer reviewed by internal and external experts.”

Assessment of evidence

- Waste management, and packing/transporting waste from isolation areas are standard IPC precautions in this guidance.
- Waste management standard precautions (Annex B):
  - "Handle faeces with caution to avoid possible generation of aerosols (e.g. during removal of faeces from bedpan, commode or clothing, or when spraying reusable incontinence pads with water)."
  - "Flush liquid waste (e.g. urine) or solid faecal waste into the sewerage system, if there is an adequate system in place."
- "Remove large amounts of solid material (e.g. faeces) from heavily soiled linen (while wearing appropriate PPE), and dispose of the solid waste in a toilet before placing the linen in the laundry bag."

Limitations

- Global guidance so is not specific to Scottish health and care settings
- No recommendations were focused on waste management, thus included evidence was in supporting text only.
- Systematic review only addressed gaps in evidence, including lessons learned from the 2009 influenza pandemic.
- Systematic review research questions were poorly reported.
- Due to be updated in 2016 which has not been carried out, and update process reported would indicate new evidence from the COVID-19 pandemic should be incorporated.
- Member affiliations are not reported.
- A number of recommendations were carried forward from the previous update so some supporting evidence is likely to be outdated.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Standards New Zealand. Management of Healthcare Waste. 2002 [cited 22 September 2023]	Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This New Zealand standard contributes to the evidence base regarding infectious waste disposal and PPE.

This New Zealand standard contains best practice guidance (beyond legislative requirements) on human and animal healthcare waste disposal including classification, segregation, packaging/containment, labelling, storage and transport, where healthcare waste refers to all waste produced by a healthcare facility.

These standards aim to assist compliance with regulations and best practice in healthcare waste management.

Guidance for compliance with NZ legislation

Sharps should only be disposed of in sharps containers.

Controlled waste can be compacted if liquid is contained and disposed of as hazardous liquid and compaction is done in such a way to minimise likelihood of airborne release of harmful substances. Meanwhile, hazardous waste should not be compacted in case containers burst and release harmful liquids or aerosols.

Table 2 provides further detail on pre-treatment methods for hazardous and controlled waste:

- Hazardous sharps – sterilisation and grinding
- Hazardous infectious solid body part – maceration and grinding; sterilisation and grinding, maceration
- Hazardous infectious liquid body part – dilute; sterilisation

Assessment of evidence
• Hazardous infectious solid – maceration; sterilisation • Hazardous infectious liquid – dilute; sterilisation To minimise harm to those handling healthcare waste: • Standard precautions in appendix D should be adhered to • Waste handling should be minimised • There should be no “manual handling” of the waste inside hazardous containers • Implement an immunisation programme • PPE should be worn that is task-appropriate, readily available, compliant with standards and good quality **Limitations** • From 2002 so may not be reflective of current best practice • How best practice determined not clear

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
U.S. Food & Drug Administration. Sharps Disposal Containers in Health Care Facilities. 2021 [cited 27 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This guidance addresses how sealed sharps containers should be handled. The US FDA provide guidance for sharps disposal containers to be used in US health facilities. Sharps disposal containers are described as “made from rigid puncture-resistant plastic or metal with leak-resistant sides and bottom, and a tight-fitting, puncture-resistant lid with an opening to accommodate depositing a sharp but not large enough for a hand to enter” (“generally” regulated by FDA as class II devices). The authors also define sharps. Once closed and sealed, healthcare workers should not open, empty or manually clean full sharps containers.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England. Health Technical Memorandum 07-01: Safe and sustainable management of healthcare waste. 2022 [cited 23 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Requirements for hazardous waste handling as per UK legislation and best practice are described in HTM 07-01. Health technical memoranda are described as “comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology” for healthcare delivery. This guidance targets safe and sustainable management of healthcare waste for all NHS Trusts, and laboratories and vet surgeries.					

Assessment of evidence
it is stated that this best practice guidance is not mandatory unless stated. Where authors have used this wording is indicated in the ETs by “”s. The authors provide the following guidance on these choices of wording: • “must” for legal compliance • “should” for a recommendation that is not mandatory • “may” for permission This guidance replaces the 2013 version, with the aim of supporting compliance with legislative changes and better capturing sustainability goals including the NHS Clinical Waste Strategy. A list of contributors is provided, and a statement thanking those from the “scoping and technical engagement phases” indicating a consultation phase but not much detail is provided on how this guidance was formed, including no indication of systematic methods. Target audience: those involved in NHS waste management (details on relevant sections by job role are signposted in Table 1, p.4), targeted towards compliance with English legislation and regulations so should not be “relied upon” by devolved nations. Those administering care in patient homes should safely dispose of any clinical or hazardous waste To comply with English legislation, the following guidance is provided for handling clinical waste: • Clinical waste bags should not be opened to check what is inside • Waste bags should not be compressed in case of splitting • Bags that are leaking or damaged “must” not be moved until the damaged waste bag is placed inside a new one • “Appropriate PPE clothing” “must” be worn The following segregation guidance is provided for compliance with English legislation: • Under the WM3 sharps themselves are not classed as hazardous but they are once they are used and so “should” be “handled with caution” to avoid injury

Assessment of evidence

- Sharps that have been used on patients “must” be placed in sharps bins for infectious, medicinally contaminated materials.

Treatment, recovery and disposal to render safe clinical waste is described (see Table 18)

“Rendered safe” is described as “an accepted method or process that has been applied which: a) demonstrates the ability to reduce the number of infectious organisms present in the waste to a level at which no additional precautions are needed to protect workers or the public against infection from the waste b) destroys anatomical waste such that it is no longer generally recognisable”.

The authors signpost to National Guidance for Healthcare Waste Water Discharges (2014) for guidance on disposing of waste streams into sewers. The authors state that advice should be sought from the sewerage undertaker and signpost to Waste (Scotland) Regulations 2012 and SEPA guidance for Scotland.

Some waste may be treated on-site. Pros to this are described.

Where on-site autoclaves stop working, waste that should be autoclaved onsite i.e. microbiological cultures and infectious waste like Category A infectious substances, “should” be packaged and transported to an incinerator as soon as possible.

Community healthcare (including home care and residential care homes) is provided, as waste producers producing waste in community care are still responsible for their waste as per DoC requirements.

Ambulatory services “should” follow community healthcare guidance for classifying, transporting and disposing of waste. More guidance is provided in Table 23. Training requirements are also described in this chapter (the system for certificates of technical competence in Scotland, also some SEPA guidance signposted).

Limitations

- The Welsh HTM 07-01 is based on the old 2013 HTM 07-01. However, this current version is also linked out in NHS Wales web pages, so it is not clear if Welsh NHS boards are also to follow this guidance.
- Unclear methodology and inconsistent in text citations used.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland Waste Management Guidance: Scottish Health Technical Note 03-01. Version 7.0. 2023 [updated 09 December 2024; cited 02 November 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

SHTN 03-01 provides guidance for handling infectious, liquid and sharps waste as per legislation in Scotland and best practice, and addresses PPE requirements.

This guidance aims to help boards in NHSScotland meet waste management legal, policy, procedural requirements and best practice in Scotland, applicable to NHSScotland healthcare services producing waste, superseding the SHTN 03-01 Parts A to D. It is stated that NHSScotland staff and contractors should not rely on the HTM 07-01 or UK-wide waste management guidance alone due to differing legal requirements across the UK.

Target audience: “staff and contractors involved at all stages of waste management in the modern healthcare setting”

Written by the NHSScotland Waste Management Steering Group. Member names and job titles are not provided.

Endorsed by SEPA.

Assessment of evidence

A disclaimer is provided stating that the guidance is “general” and accurate at time of publication.

Training and audit requirements are also described in chapters 14 and 15 respectively but are out-with the remit of this review.

Table 3.1 provides examples of hazardous (special) versus non-hazardous waste, including infectious or potentially infectious waste as hazardous.

“In Scotland, all liquid blood must be solidified using preparatory gels prior to disposal.”

“Items used to administer, or that are contaminated with, other (non-cyto) medicinal waste such as used syringes (including those from vaccination programmes using attenuated live vaccines) may be treated as infectious clinical waste but are not suitable for clinical waste treatment within the orange stream as it requires disposal via high temperature incineration.”

Orange lidded sharps boxes are described as the colour-coded packaging for sharps waste with no medicinal contamination. Different EWCs are provided for sharps classed as hazardous and non-hazardous.

Category A packaging - “In the highly unlikely event that the waste does meet the criteria for Category A waste (such as a notifiable disease), it should be classified as UN3549 and placed in appropriate yellow UN-approved packages for this type of waste (which may differ from other yellow containers used in hospitals). Wherever possible, Category A infectious substances (including waste) should be treated on site (using an autoclave or equivalent) before being transported for disposal. Once treated it should be classified as clinical waste (Category B infectious substance - UN3291) on a precautionary basis and to ensure it is rendered unrecognisable.”

Anatomical/ethical waste – “In Scotland, all liquid blood, where possible must be solidified using preparatory gels prior to disposal. It is accepted that in practice this may not always be possible when dealing with patient fluids in a clinical setting, for example urine, vomit and faeces may all contain blood and should be disposed of appropriately within the ward setting.”

In Table 5.1 “Colour-coding segregation for primary waste receptacles”:

- “Orange lidded leak resistant bin for solidified infectious liquids (including blood), tube and suction sets, unrecognisable tissue waste and dialysis waste”

Assessment of evidence
• "Orange bag for non-sharp potentially infectious items incl. dressings, swabs, disposables, used Personal Protective Equipment (PPE), contaminated wipes, spillage sets, nappies, incontinence pads, empty blood bags and autoclaved lab waste. Not suitable for liquids" "Specific" waste stream segregation: • Liquid and solidified liquid waste "should be placed in a rigid leak-proof receptacle for disposal". Waste treatment facilities may require that liquid waste is solidified. "Disposal via rigid container will be very much a risk assessment and will be of higher occurrence in specific areas following specific care. It is accepted that in practice this may not always be possible when dealing with patient fluids in a clinical setting, for example urine, vomit and faeces may all contain blood and should be disposed of appropriately within the ward setting." "under the Landfill Regulations, liquid waste cannot be sent for disposal to a landfill site" • Only sharps waste should be disposed of in sharps waste containers/bins • Category A infectious waste: classed as UN3549 under the ADR, should be treated on site before uplift. Should not be left for 24 hours before treatment or uplift (if no autoclave on site) The following waste may be "rendered safe" following treatment: • "demonstrates the ability to reduce the number of infectious organisms present in the waste to a level whereby no additional precautions are needed to protect workers or the public against infection by the waste • destroys anatomical waste such that it is no longer generally recognisable • renders sharps unusable and no longer in their original shape and form • destroys the component chemicals of medicinal waste" Treatment and disposal strategies are described (p.67) The authors state that only domestic sewage should be disposed into the sewer without "prior agreement of the statutory responsible bodies". The following can pose issues when disposed of in domestic sewer:

Assessment of evidence
• Body fluids like blood can be disposed of in the foul sewer “subject to any restrictions imposed by the discharge consent and compliance with any local infection control procedures where material is not being disposed of via the clinical waste stream” • Photochemical (xray) • Cardboard bed pans and urine bottles – maceration and disposal into foul sewer can cause blockages, so sewage undertaker should be consulted • Medicinal waste “Control of Substances Hazardous to Health (COSHH) Regulations (see Section 1) require that risks to health be eliminated, prevented or, where this is not reasonably practicable, reduced. Although the use of personal protective equipment (PPE) should be considered as additional to other control measures, it is likely that some PPE will still be required even after all reasonably practicable precautions have been taken to reduce the exposure of staff who handle, transfer, transport, treat or dispose of healthcare waste.” PPE required should be determined by employers’ risk assessment which also addresses spills. “This might include the need for protective equipment to prevent exposure via routes such as skin contact (for example, disposable aprons and gloves) or inhalation/ ingestion (for example, respiratory protection and/ or face visors).” “Basic personal hygiene is important in reducing the risk from handling healthcare waste. Employers need to ensure that washing facilities are conveniently located for people handling healthcare waste and this is particularly important at storage and incineration facilities” Immunisation plus tools to make a fully informed decision should be offered to staff handling healthcare waste. Under the chapter on audits, it is stated that “In-use receptacles are visually inspected without removing the waste. For example, the contents of a sharps box can be viewed from the aperture or opening on the box”.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Control of Substances Hazardous to Health Regulations 2002. 2002 [cited 24 August 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 as applicable to sharps disposal and PPE when handling waste in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that “These Regulations re-enact, with modifications, the Control of Substances Hazardous to Health Regulations 1999 (S.I. 1999/437) (“the 1999 Regulations”). The 1999 Regulations imposed duties on employers to protect employees and other persons who may be exposed to substances hazardous to health and also imposed certain duties on employees concerning their own protection from such exposure, and prohibited the import into the United Kingdom of certain substances and articles from outside the European Economic Area.” Please see below entry for HSE guidance for employers to adhere to COSHH regulations.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Landfill (Scotland) Regulations 2003. 2003 [cited 12 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 as applicable to infectious and liquid waste disposal in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that “These Regulations set out a pollution control regime for landfills for the purpose of implementing Council Directive 99/31/EC on the landfill of waste (“the Landfill Directive”) in Scotland.” Regulation 11 states that “The operator of a landfill shall not accept any of the following types of waste at the landfill– […]any waste in liquid form (including waste waters but excluding sludge); […] any waste in liquid form (including waste waters but excluding sludge);” where ““infectious” if it consists of substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms;”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste. 1999. Accessed 12 December 2023.	Legislation	**Mandatory**			
Assessment of evidence					
This Council Directive is implemented by the Landfill Regulations (see above entry). Article 1 describes the objective of the directive: “the aim of this Directive is, by way of stringent operational and technical requirements on the waste and landfills, to provide for measures, procedures and guidance to prevent or reduce as far as possible negative effects on the environment, in particular the pollution of surface water, groundwater, soil and air, and on the global environment, including the greenhouse effect, as well as any resulting risk to human health, from landfilling of waste, during the whole life-cycle of the landfill.”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Council of the European Union. Council Directive 2010/32/EU of 10 May 2010 implementing the Framework Agreement on prevention from sharp injuries in the hospital and healthcare sector concluded by HOSPEEM and EPSU (Text with EEA relevance). 2010 [cited 15 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Accessed 15 December 2023.Assessment of evidence					
Implemented by the Health and Safety (Sharp Instruments in Healthcare) Regulations (2013). “This Directive implements the Framework Agreement on prevention from sharp injuries in the hospital and healthcare sector”					

Evidence from previous update(s):

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety at Work etc. Act 1974. 1974 [cited 13 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in RCN guidance as applicable to sharps disposal in Scottish health and care settings (see below entry). "An Act to make further provision for securing the health, safety and welfare of persons at work, for protecting others against risks to health or safety in connection with the activities of persons at work, for controlling the keeping and use and preventing the unlawful acquisition, possession and use of dangerous substances, and for controlling certain emissions into the atmosphere; to make further provision with respect to the employment medical advisory service; to amend the law relating to building regulations, and the Building (Scotland) Act 1959; and for connected purposes." This legislation is not specific to health and care settings, but for all employers in the UK.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
National Institute for Health and Care Excellence (NICE). Healthcare-associated infections: prevention and control in	Guideline	**AGREE II Recommend**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
primary and community care. 2012 [updated 2017]					
Assessment of evidence					
Recommendations made in this guideline informed the evidence base regarding sharps waste disposal. These guidelines aim to provide standard healthcare-associated infection prevention and control guidelines for healthcare workers working in primary and community care settings. Systematic literature searches were run, with most recent searches for the 2012 update carried out on 18 April 2011 on MEDLINE, Embase, CINAHL and The Cochrane Library. Titles and abstracts of identified papers were screened by a research fellow and full papers were compared to inclusion/exclusion criteria so that studies relevant to the research questions could be appraised. Clinical findings informed recommendations. However, where clinical evidence was lacking or poor quality, the guideline development group provided input. There was an external review process as part of the guidelines' validation process. In chapter 4 (Guideline summary), key priorities are highlighted, including: • It is stated that at the time of publication in 2012, this recommendation was required for compliance with the following health and safety legislation: "Health and Safety at Work Act 1974, Management of Health and Safety at Work Regulations 1999, Health and Safety Regulations 2002, Control of Substances Hazardous to Health Regulations 2002, Personal Protective Equipment Regulations 2002, and Health and Social Care Act 2008" In chapter 8 ("Standard principles for the safe use and disposal of sharps"): • The authors state that, as part of the 2012 update, the review questions on choice of safety cannulae and safety needles were updated					

Assessment of evidence

- “Used standard needles: must not be bent or broken before disposal; must not be recapped. In dentistry, if recapping or disassembly is unavoidable, a risk assessment must be undertaken and appropriate safety devices should be used” [new 2012]
  - This recommendation includes the caveat that needles can be bent if they are part of an approved sharps safety device
  - The development group signposted to the EU Directive (2010/32/EU) from 2010 which was then implemented in UK legislation from 2013, stating that “Where the results of the risk assessment reveal a risk of injuries with a sharp and/or infection, workers’ exposure must be eliminated by taking the following measures, without prejudice to their order: the practice of recapping shall be banned with immediate effect...”
  - There was no clinical evidence supporting this recommendation
  - The development group also highlighted that all healthcare workers should be trained in sharps management, including sharps in patient’s homes
- “Use sharps safety devices if a risk assessment has indicated that they will provide safer systems of working for healthcare workers, carers and patients.” [new 2012]
  - Based on low quality evidence
  - Only one study underlying this recommendation related specifically to sharps disposal

- The following guidance on safe sharps disposal was updated in line with legislation:
  - “Used sharps must be discarded immediately into a sharps container conforming to current standards by the person generating the sharps waste” [new 2012]
    - To comply, those generating sharps waste should have access to sharps containers meeting required standards
    - The authors signpost to BS EN ISO 23907:2012
  - “Sharps containers:

Assessment of evidence
○ must be located in a safe position that avoids spillage, is at a height that allows the safe disposal of sharps, is away from public access areas and is out of the reach of children ○ must not be used for any other purpose than the disposal of sharps ○ must not be filled above the fill line ○ must be disposed of when the fill line is reached ○ should be temporarily closed when not in use" [new 2012] ○ The authors signpost to an old version of the HTM 07-01 for this recommendation **Limitations** • One major limitation is that it is not clear how many researchers contributed to the systematic literature searches. • It is stated that, as of 2017, the guideline has been transferred to the "static list", but it is not clear what this is as the hyperlink to the static list does not work. • The safe disposal of waste chapter has not been included in this AGREE appraisal as the authors state that "A literature search was not performed for these questions as the objective was to review and update the current recommendations about the safe disposal of personal protective equipment and safe disposal of sharps in line with patient care and with the European Union (EU) and national legislations. The Department of Health guidance; Safe Management of Healthcare Waste version 1.072 was reviewed." This DoH document is now out of date and has been captured elsewhere in the review.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. The Control of Substances Hazardous to Health Regulations 2002 (as Amended) Approved Code of Practice and Guidance. 2013 [cited 24 August 2023]	Guidance for legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence

Guidance supporting legislation which is applicable to sharps disposal in UK health and care settings.

This document by HSE provides methods for compliance with the Control of Substances Hazardous to Health Regulations 2002 (as amended) (COSHH). List of amendments on p.5, including Control of Substances Hazardous to Health (Amendment) Regulations 2004 (SI 2004/3386). The target audience is duty holders and health and safety professionals.

Regulation 2 Interpretation

Biological agent is described as “a micro-organism, cell culture, or human endoparasite, whether or not genetically modified, which may cause infection, allergy, toxicity or otherwise create a hazard to human health” (p.7). biological agents are among a list of substances described as being hazardous to health (p.9)

Hazard “in relation to a substance” is described as “the intrinsic property of that substance which has the potential to cause harm to the health of a person, and “hazardous” shall be construed accordingly” (p.8)

Assessment of evidence

Risk is defined as “in relation to the exposure of an employee to a substance hazardous to health, means the likelihood that the potential for harm to the health of a person will be attained under the conditions of use and exposure and also the extent of that harm” (p.8)

Guidance:

- HSE guidance states that “COSHH applies to a wide range of substances and preparations (mixtures of two or more substances) which have the potential to cause harm to health if they are ingested, inhaled, or are absorbed by, or come into contact with, the skin, or other body membranes”.
- It is stated that biological agents that come under COSHH as substances hazardous to health include: “micro-organisms such as bacteria, viruses, fungi, and the agents that cause transmissible spongiform encephalopathies (TSEs)”; “cell cultures, if the cell being cultured is itself hazardous”; and “parasites that live inside their host, including single-cell organisms, e.g. malarial parasites, amoebae and trypanosomes and the microscopic infectious forms of larger parasites, e.g. the microscopic ova and infectious larval (helminths)”
- COSHH covers employee exposure to biological agents at work, for example through contact with blood and body fluids.

Regulation 7 Prevention or control of exposure to substances hazardous to health

COSHH requires that:

1. “Every employer shall ensure that the exposure of his employees to substances hazardous to health is either prevented or, where this is not reasonably practicable, adequately controlled.”

3. “Where it is not reasonably practicable to prevent exposure to a substance hazardous to health, the employer shall comply with his duty of control under paragraph (1) by applying protection measures appropriate to the activity and consistent with the risk assessment, including, in order of priority -

(a) The design and use of appropriate work processes, systems and engineering controls and the provision and use of suitable work equipment and materials;

(b) the control of exposure at source, including adequate ventilation systems and appropriate organisational measures; and

Assessment of evidence
(c) where adequate control of exposure cannot be achieved by other means, the provision of suitable personal protective equipment in addition to the measures required by sub-paragraphs (a) and (b).” 4. “The measures referred to in paragraph (3) shall include - (a) arrangements for the safe handling, storage and transport of substances hazardous to health, and of waste containing such substances and be provided with appropriate hygiene measures including adequate washing facilities at the workplace.” 6. “Without prejudice to the generality of paragraph (1), where it is not reasonably practicable to prevent exposure to a biological agent, the employer shall apply the following measures in addition to those required by paragraph (3) – (a) displaying suitable and sufficient warning signs, including the biohazard sign shown in Part IV of Schedule 3;” “(c) instituting means for the safe collection, storage and disposal of contaminated waste, including the use of secure and identifiable containers, after suitable treatment where appropriate;” “(e) specifying procedures for working with, and transporting at the workplace, a biological agent or material that may contain such an agent” 7, “Principles of good practice for the control of exposure to substances hazardous to health”: “Design and operate processes and activities to minimise emission, release and spread of substances hazardous to health. (b) Take into account all relevant routes of exposure – inhalation, skin absorption and ingestion – when developing control measures. (c) Control exposure by measures that are proportionate to the health risk. (d) Choose the most effective and reliable control options which minimise the escape and spread of substances hazardous to health. (e) Where adequate control of exposure cannot be achieved by other means, provide, in combination with other control measures, suitable personal protective equipment. (f) Check and review regularly all elements of control measures for their continuing effectiveness.

Assessment of evidence

(g) Inform and train all employees on the hazards and risks from the substances with which they work and the use of control measures developed to minimise the risks.

(h) Ensure that the introduction of control measures does not increase the overall risk to health and safety"

ACOP:

- The authors explain that employers should firstly consider hazardous substance exposure in terms of eliminating these substances hazardous to health. Where this is not possible, options for reducing exposure should be considered. Where hazardous substance exposure cannot be prevented, employers should apply regulations 7(3) and 7(4) (p.29).
- "The employer should consider the way employees will use the controls when making decisions about their design, installation and use. […] Employers should also consider the arrangements for the safe handling, storage and transport of hazardous substances, of waste containing such substances, and suitable maintenance procedures etc."
- For control of biological agent exposure, employers should "adequately" control exposure (see 7(3-7)), not all regulation 7(6) measures will be requited for "incidental" exposure, and if vaccines are readily available, they should be offered.
- PPE may be required if good practice is not sufficient to control exposure.

Guidance:

- HSE describe the objective of COSHH as "to prevent, or adequately control, exposure to substances hazardous to health so as to prevent ill health"
- The principles from regulation 7(1) are described with associated guidance (p.30)
- For control of biological agent exposure,

Regulation 8 Use of control measures etc

"(1) Every employer who provides any control measure, other thing or facility in accordance with these Regulations shall take all reasonable steps to ensure that it is properly used or applied as the case may be. (2) Every employee shall make full and proper use of any control measure, other thing or facility provided in accordance with these Regulations and, where relevant, shall – (a) take all

Assessment of evidence
reasonable steps to ensure it is returned after use to any accommodation provided for it; and (b) if he discovers a defect therein, report it forthwith to his employer.”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 Guidance for employers and employees. 2013 [cited 08 November 2023]	Guidance for legislation	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Guidance supporting legislation which is applicable to sharps disposal in UK health and care settings. Aim: Assist understanding of “legal obligations under the Health and Safety (Sharp Instruments in Healthcare) Regulations 2013 (the Sharps Regulations)”, implementing the European Council Directive 2010/32/EU (the Sharps Directive) in UK legislation. Target audience: “healthcare employers and employees” “Place secure containers and instructions for safe disposal of medical sharps close to the work area – regulation 5(1)(d)”					

Assessment of evidence
“Regulation 7(6)(c) of COSHH requires systems to dispose of contaminated waste safely. The Sharps Regulations supplement this by requiring that clearly marked and secure containers be placed close to the areas where medical sharps are used. Instructions for staff on safe disposal of sharps must also be placed in those areas.” Sharps bins should be placed next to the healthcare worker in healthcare facilities. However, where this is not possible (examples of paramedics or home care are provided), a risk assessment by the employer should determine what sharps are used, “safe working procedures”, portable sharps containers to be used, and how these should be collected and replaced. Training and incident reporting requirements are also described

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Sunley K, Gallagher R, Reidy MP, et al. Essential Practice for Infection Prevention and Control - Guidance for nursing staff. London: Royal College of Nursing, 2017	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This RCN guidance describes best practice points for sharps disposal and summarises relevant legislation.					

Assessment of evidence
This document produced by the Royal College of Nursing is practice guidance based on evidence-based consensus to influence care decisions, with a focus on good infection prevention and control practices. Under “Safe handling and disposal of sharps”: Sharps are defined as encapsulating “needles, scalpels, stitch cutters, glass ampoules, bone fragments and any sharp instrument”, presenting risk of blood borne virus if a sharps injury occurs. An example of sharps injuries from sharps being put in waste bins is provided. Therefore, sharps should be disposed of safely according to local policy. The authors describe legislation in relation to sharps: • European Directive 2010/32/EU, UK transposition - Health and Safety (Sharps Injuries in Healthcare) Regulations 2013, where employers should assess sharp injury risk and eliminate sharp use if possible, but where this is not possible, measures should be taken to mitigate risk of injury e.g. safety engineered devices. • The Health and Safety at Work Act 1974 and COSHH 2002 also apply • Sharps injuries should be reported under RIDDOR 1995 As such, the authors provide “best practice points” for sharps use: • Minimise sharps handling • Do not dismantle syringes or needles, but instead place them in sharps containers as a “single unit” • Sharps containers should be placed close to point of production e.g. sharps trays with integrated sharps boxes • Needles should not be recapped, broken or bent before disposal • Safe disposal and transport protocols should be established for sharps in community settings Under “Safe handling and disposal of waste”: Waste disposal and segregation should be encapsulated in local policy, including colour-coding of waste.

Assessment of evidence
Limitations • This document was due to be updated in November 2020 but has not been.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Sehulster L, Chinn RY; CDC; HICPAC. Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). MMWR Recomm Rep. 2003;52(RR-10):1-42.	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Specific recommendations are made in this CDC guidance regarding hazardous waste management.					

Assessment of evidence
The aim of this document was to provide evidence-based environmental infection control guidance for prevention of “environmentally mediated infections, particularly among health-care workers and immunocompromised patients”. Studies included were outbreak studies (considering “environmental opportunistic microorganisms and epidemiological- or laboratory experimental studies”) and organisational standards and guidelines, supplemented by expert opinion where there was insufficient evidence. Although literature searches were carried out, there was not enough evidence to deduce that methods were systematic, so this guidance was graded as Level 4. Recommendations: There should be a plan in place for collecting, handling, predisposal treatment of and final disposal of regulated medical waste (Category IC) Those handling and disposing of waste that is potentially infectious should be informed of any health and safety hazards and be appropriately trained (Category IC) Regulated medical waste from isolation areas should be handled and disposed of in the same way as medical waste from other patient-care areas (Category II) For sharps disposal (Category IC): • Sharps disposal containers should remain impermeable after treatment to avoid injury • Disposable syringes with needles (including sterile sharps), scalpel blades, and other sharps should be placed in puncture-resistant containers as close as possible to point of use • Syringes should not be bent, recapped or broken before disposal Blood, suctioned fluid, ground tissue, excretion and secretion can be disposed of in sanitary sewers “provided that local sewage discharge requirements are met and that the state has declared this to be an acceptable method of disposal” (Category II)

Assessment of evidence
Items contaminated with blood and body fluids from VHF patients that need disposed of should be contained “with minimal agitation during handling” (Category II) Waste from areas where VHF patients are being cared for should be managed in line with recommendations for other isolation areas (Category II) Bulk blood and body fluids from VHF patients should be decontaminated with inactivation methods like autoclaving or chemical treatment before disposal (Category IC, II) Within the summary of evidence on managing regulated medical waste, it is also stated that: • “A single, leak-resistant biohazard bag is usually adequate for containment of regulated medical wastes, provided the bag is sturdy and the waste can be discarded without contaminating the bag’s exterior. The contamination or puncturing of the bag requires placement into a second biohazard bag..”, referencing OSHA occupational exposure guidance from 1991 • “Health-care facilities may need additional precautions to prevent the production of aerosols during the handling of blood-contaminated items for certain rare diseases or conditions (e.g., Lassa fever and Ebola virus infection)”, referencing CDC guidance from 1995 Within the summary of evidence on discharging blood and body fluids into sanitary sewers or septic tanks, it is also stated that: • There was no evidence identified to suggest that bloodborne diseases could be transmitted through contact with “raw or treated” sewage Note – in the appendices the authors signpost to an external source on regulated medical wastes in the U.S, where it is stated that (regulated) medical waste is “healthcare waste that that may be contaminated by blood, body fluids or other potentially infectious materials”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Health and Safety (Sharp Instruments in Healthcare) Regulations 2013. 2013 [cited 03 October 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is applicable to sharps disposal in UK health and care settings. In the Explanatory Note, it states that “Regulation 5 concerns the use and disposal of medical sharps – in particular, it provides that the use of medical sharps should be avoided so far as is possible, otherwise that ‘safer sharps’ are used where possible. It prohibits the practice of ‘re-capping’ except where required to control risk and where the risk to the employee is controlled by means of special equipment”. In relation to sharps disposal, Regulation 5 states that “(d) in relation to the safe disposal of medical sharps that are not designed for re-use— (i) written instructions for employees, and (ii) clearly marked and secure containers, are located close to areas where medical sharps are used at work.”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Loveday HP, Wilson JA, Pratt RJ, et al. epic3: National Evidence-Based Guidelines for Preventing Healthcare-Associated Infections in NHS Hospitals in England. J Hosp Infect. 2014; 86(1):1-70.	Guideline	**AGREE II Recommend with Modifications**	N/A	N/A	N/A

Assessment of evidence

Specific recommendations are made in this UK guideline regarding sharps disposal.

Loveday et al. provide guidelines for preventing hospital infections for healthcare workers in NHS England hospitals. Systematic reviews were carried out for each topic with pre-defined research questions, developed by "a team of specialist infection prevention and control researchers and clinical specialists and a Guideline Development Advisory Group".

The following recommendations are made regarding sharps disposal:

- "Sharps must not be passed directly from hand to hand, and handling should be kept to a minimum. Class D/GPP/H&S"
- "Needles must not be recapped, bent or disassembled after use. Class D/GPP/H&S"
- "Used sharps must be discarded at the point of use by the person generating the waste. Class D/GPP/H&S"
- "All sharps containers must:

Assessment of evidence
○ conform to current national and international standards; ○ be positioned safely, away from public areas and out of the reach of children, and at a height that enables safe disposal by all members of staff; ○ be secured to avoid spillage; ○ be temporarily closed when not in use; ○ not be filled above the fill line; and ○ be disposed of when the fill line is reached. Class D/GPP/H&S” • “All clinical and non-clinical staff must be educated about the safe use and disposal of sharps and the action to be taken in the event of an injury. Class D/GPP/H&S” The authors also state that sharps safety device use may have a “downstream” effect on reducing injuries after disposal. They provide evidence and recommendations for safer sharps devices (Class C and Class D), but do not report a specific link in the evidence to sharps disposal in particular. **Limitations** • Did not provide a full search strategy • Did not carry out two person full text screening • Did not report external review with stakeholders • Was not updated as reported • Not clear if legislation reflects any updates/changes • All sharps disposal recommendations are Class D (“Evidence level 3 or 4; or Extrapolated evidence from studies rated as 2+”) or Good Practice Points (“Recommended best practice based on the clinical experience of the Guideline Development advisory Group and patient preference and experience”), so reflect low quality evidence and/or expert opinion and/or H&S legislation.

Question 8: How should non-hazardous waste be handled in health and care settings?

Evidence added to Literature Review V5.0

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Scottish Government. Duty of Care – A Code of Practice. 2012 [cited 25 August 2023]	Statutory guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This Scottish Government guidance describes legislative requirements for waste producers under the Duty of Care, including requirements for handling non-hazardous waste.

This statutory guidance document produced by the Scottish Government outlines duties for controlled waste producers, keepers, importers and/or managers in Scotland under Section 34 of the Environmental Protection Act 1990 (as amended). Published in 2012 but has regulatory requirements for 2014 onwards, in line with the implementation of The Environmental Protection (Duty of Care) (Scotland) Regulations 2014.

The authors explain that this document is intended to address waste management based on a person's role in the Duty of Care.

Waste producer obligations

A waste producer is "any person (with the exception of an occupier of domestic property in respect of waste produced on that property) who produces waste in the course of their activities", and the authors state that they have the most important role in waste management, as they are best suited to describe the waste accurately, and therefore its' safe management through the latter stages of the waste management process.

Assessment of evidence
To comply with Section 34, “as a waste producer, you must:” • “Take steps to maintain the quality of dry recyclables presented for separate collection.” • “Take care of the waste while you hold it so it does not escape from your control. • Ensure your waste is transferred to someone who is authorised to receive it, for example, a registered waste carrier or waste manager with the relevant authorisation. Or, if you are carrying your own waste that you are appropriately registered with SEPA. • Complete a waste transfer note for any transfer of waste, including a full description of the waste, and retain a copy of this note for two years. • Describe the waste accurately and provide information for the safe handling, transport, treatment, recovery or disposal by subsequent holders. • Take reasonable measures to ensure that your waste does not cause pollution or harm to human health.” • Responsibilities in relation to the waste hierarchy and high quality recycling are also described. **Limitations** • Not health and social care specific • Large focus on recycling/repurposing – Zero Waste Plan • Not focused on IPC or infectious waste

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Safe management of wastes from health-care activities, 2nd ed. 2014 [cited 15 September]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

WHO guidance which provides an estimate of the proportion of waste that is produced in health and care settings which is classed as non-hazardous.

This WHO guidance provides guidance on safe handling and disposal of waste from health care globally, also addressing waste management options for developing countries. This second addition of 'The Blue Book' updates guidance from 2007.

This guidance comprises of expert opinion from "internal consultation and collaboration" at a conference in 2007, with peer-review of each chapter from experts worldwide. Names of those who contributed to the first edition are provided in appendix 1.

Target audience: "medical staff, health-care facility directors, ancillary health workers, infection-control officers and waste workers […] regulators, policy-makers, development organizations, voluntary groups, environmental bodies, environmental health practitioners, advisers, researchers and students"

75 to 90% (later figure of approx. 85% also provided) of waste from healthcare is estimated to be non-hazardous i.e. "Waste that does not pose any particular biological, chemical, radioactive or physical hazard"

Non-hazardous waste should not present risk of hazard

General waste from patient care should be considered low risk unless a patient has a known communicable infection.

Assessment of evidence
Limitations • This guidance is from 2014 so some guidelines may be out of date

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Standards New Zealand. Management of Healthcare Waste. 2002 [cited 22 September 2023]	Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This New Zealand standard defines non-hazardous waste and requirements for handling such waste. This New Zealand standard contains best practice guidance (beyond legislative requirements) on human and animal healthcare waste disposal including classification, segregation, packaging/containment, labelling, storage and transport, where healthcare waste refers to all waste produced by a healthcare facility. These standards aim to assist compliance with regulations and best practice in healthcare waste management. Non-hazardous waste is waste that is does not conform to definitions of controlled or hazardous waste. Non-hazardous waste can be compacted to minimise volume. To minimise harm to those handling healthcare waste: • Standard precautions in appendix D should be adhered to

Assessment of evidence
• Waste handling should be minimised • PPE should be worn that is task-appropriate, readily available, compliant with standards and good quality **Limitations** • From 2002 so may not be reflective of current best practice • How best practice determined not clear • Guidance for compliance with NZ legislation

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England. Health Technical Memorandum 07-01: Safe and sustainable management of healthcare waste. 2022 [cited 23 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
HTM 07-01 provides guidance for handling non-hazardous waste in health and care settings, including offensive waste. Health technical memoranda are described as “comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology” for healthcare delivery. This guidance targets safe and sustainable management of healthcare waste for all NHS Trusts, and laboratories and vet surgeries.					

Assessment of evidence
it is stated that this best practice guidance is not mandatory unless stated. Where authors have used this wording is indicated in the ETs by “”s. The authors provide the following guidance on these choices of wording: • “must” for legal compliance • “should” for a recommendation that is not mandatory • “may” for permission This guidance replaces the 2013 version, with the aim of supporting compliance with legislative changes and better capturing sustainability goals including the NHS Clinical Waste Strategy. A list of contributors is provided, and a statement thanking those from the “scoping and technical engagement phases” indicating a consultation phase but not much detail is provided on how this guidance was formed, including no indication of systematic methods. Target audience: those involved in NHS waste management (details on relevant sections by job role are signposted in Table 1, p.4), targeted towards compliance with English legislation and regulations so should not be “relied upon” by devolved nations. “Offensive waste is non-hazardous. If an item is known to be infectious, contaminated with chemicals/medicines, is radioactive, or is sharp, it is not offensive waste.” Appendix 2 outlines how non-clinical waste should be handled. The authors recommend hand washing and making sure that clothes and PPE remain clean after handling offensive waste. Guidance for offensive waste is provided: • Liquid offensive waste like urine, liquid faeces and vomit can be disposed of in a sewer – under Landfill (Scotland) Regulations (2003) these should not be disposed of in landfill. • Although offensive waste is not hazardous, the authors recommend hand washing after handling offensive waste, and ensuring clean clothing and PPE. Disposal and recovery options are described.

Assessment of evidence
• Offensive liquid waste can be disposed of into the foul sewer or “by being absorbed onto a cloth or solidified with absorbent or gelling granules before being placed into the bin. There should be no free-flowing liquid present” – this will be determined by risk assessment. **Limitations** • The Welsh HTM 07-01 is based off of the old 2013 HTM 07-01. However, this current version is also linked out in NHS Wales web pages, so it is not clear if Welsh NHS boards are also to follow this guidance. • Unclear methodology and inconsistent in text citations used.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland Waste Management Guidance: Scottish Health Technical Note 03-01. Version 7.0. 2023 [updated 09 December 2024; cited 02 November 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
SHTN 03-01 provides guidance for handling non-hazardous waste, including offensive/hygiene waste, in Scottish health and care settings. This guidance aims to help boards in NHSScotland meet waste management legal, policy, procedural requirements and best practice in Scotland, applicable to NHSScotland healthcare services producing waste, superseding the SHTN 03-01 Parts A to D. It is stated that NHSScotland staff and contractors should not rely on the HTM 07-01 or UK-wide waste management guidance alone due to differing legal requirements across the UK. Target audience: “staff and contractors involved at all stages of waste management in the modern healthcare setting” Written by the NHSScotland Waste Management Steering Group. Member names and job titles are not provided. Endorsed by SEPA. A disclaimer is provided stating that the guidance is “general” and accurate at time of publication. Training and audit requirements are also described in chapters 14 and 15 respectively but are out-with the remit of this review. Classifying infectious waste for transport: • Hygiene and sanpro waste are not considered infectious so not classed as dangerous goods Unified definitions based on legislation have been compiled “to help waste producers comply with regulatory requirements” and is considered best practice: • Infectious waste (from definitions provided in Controlled Waste Regulations 1992, Special Waste Amendment (Scotland) Regulations 2004 and WM3 guidance and international carriage by road (ADR)):   ○ “Waste contaminated with non-infectious bodily fluids is capable of causing offence and therefore requires appropriate packaging to alert those in the waste management chain of the contents. This document identifies such waste as offensive/hygiene waste; it may also be known as ‘sanpro waste’.”

Assessment of evidence
• Offensive or human hygiene waste is defined as “waste which may cause offense to persons coming into contact with it but does not pose a risk of infection”, with examples provided – sanitary waste, nappies, etc., and “should be described using the European Waste Catalogue (EWC) code 18.01.04, and the written description ‘offensive/ hygiene waste from human healthcare’”
“Specific” waste stream segregation:
• “Hygiene waste is not considered to be an infectious waste. However, it may cause offence and should not be compacted unless in accordance with the conditions of a waste management licence or permit. It should be noted that in a healthcare/ clinical setting the use of the offensive/ hygiene waste stream must be supported by a robust risk assessment which also considers all circumstances such as enteric infections for example.” And signpost to NetRegs guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Landfill (Scotland) Regulations 2003. 2003 [cited 12 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence
This legislation is signposted in HTM 07-01 as applicable to offensive/hygiene in Scottish health and care settings (see above entry).
In the Explanatory Note, it is stated that “These Regulations set out a pollution control regime for landfills for the purpose of implementing Council Directive 99/31/EC on the landfill of waste (“the Landfill Directive”) in Scotland.”
Regulation 11 states that “The operator of a landfill shall not accept any of the following types of waste at the landfill– […]any waste in liquid form (including waste waters but excluding sludge); […] any waste in liquid form (including waste waters but excluding sludge);”

Assessment of evidence
where ““infectious” if it consists of substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms;”

Question 9: How should waste be labelled or tagged in health and care settings?

Evidence added to Literature Review V5.0

Study	Study Type	Evidence Level/*	Intervention	Comparison	Outcome measure
Scottish Government. Duty of Care – A Code of Practice. 2012 [cited 25 August 2023]	Statutory guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Labelling requirements for waste as per Scottish legislation are described in this Scottish Government Code of Practice. This statutory guidance document produced by the Scottish Government outlines duties for controlled waste producers, keepers, importers and/or managers in Scotland under Section 34 of the Environmental Protection Act 1990 (as amended). Published in 2012 but has regulatory requirements for 2014 onwards, in line with the implementation of The Environmental Protection (Duty of Care) (Scotland) Regulations 2014. The authors explain that this document is intended to address waste management based on a person’s role in the Duty of Care.					

Assessment of evidence

Waste producer obligations

A waste producer is “any person (with the exception of an occupier of domestic property in respect of waste produced on that property) who produces waste in the course of their activities”, and the authors state that they have the most important role in waste management, as they are best suited to describe the waste accurately, and therefore its’ safe management through the latter stages of the waste management process.

To comply with Section 34, “as a waste producer, you must:”

- “Complete a waste transfer note for any transfer of waste, including a full description of the waste, and retain a copy of this note for two years.
- Describe the waste accurately and provide information for the safe handling, transport, treatment, recovery or disposal by subsequent holders.”

In terms of describing waste, waste transfer notes should be used for when waste transfers to another holder, including a written description of the waste so that the receiver can act in line with their Duty of Care. A signed copy of this should be retained for two years. For special waste a consignment note should be used instead, in line with the Special Waste Scotland Regulations 1996 (as amended). Descriptions of the waste should be “adequate”, i.e. consider the “nature” of the waste, for example, is a special container required, may its’ physical state change during transport and/or storage.

Limitations

- Not health and social care specific
- Large focus on recycling/repurposing – Zero Waste Plan
- Not focused on IPC or infectious waste

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health. Health Building Note 00-09: Infection control in the built environment. 2013 [cited 28 August 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
IPC considerations regarding labelling receptacles are addressed in this health building note. This Health Building Note aims to address IPC issues and risks to address during project design and construction. This guidance can be applied to all healthcare facilities, but does not extend to operational IPC management like outbreaks or standard precautions. It is intended to be cross referenced with the Health and Social Care Act 2008: Code of Practice Target audience: “all providers of NHS care”; “NHS Trust CEs, Care Trust CEs, Foundation Trust CEs, Medical Directors, Directors of PH, Directors of Nursing, Allied Health Professionals, Communications Leads, Emergency Care Leads” Waste receptacle lids should not be labelled as this may inhibit cleaning/disinfection.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
European Centre for Disease Prevention and Control (ECDC). Safe use of personal protective equipment in the treatment of infectious diseases of high consequence: A tutorial for trainers in healthcare settings. 2014 [updated 03 December 2014; cited 29 August 2014]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Labelling considerations for waste bags and containers and sharps containers used for HCID waste are provided in this ECDC guidance. This ECDC tutorial aims to contribute to better hospital preparedness in Europe by addressing technical requirements for PPE for HCID, critical aspects of these ensembles, protection beyond PPE and occupational safety and health. This document was developed by ECDC and external experts, addressing documents on PPE for Ebola patient care (from international and European organisations) and guidelines and training materials from the WHO, US CDC and Medicins sans Frontieres.					

Assessment of evidence
Target audience: Mainly “future PPE instructors with a background in infection control and hygiene in hospital settings” and “professionals in communicable diseases, infection control and hospital hygiene experts, hospital managers in charge of administration, nursing, OSH and emergency planning [; …] experts in preparedness at the regional and national levels” Waste bags and containers should be “clearly labelled as highly infectious waste” Under “Considerations on barrier management”, the authors state: • “Infected materials should be put in impermeable bags or hard plastic containers. These bags and containers need to be clearly labelled as highly infectious waste.” • Sharp and point objects like open vials and needles should be put in “hard plastic containers” and clearly labelled **Limitations** • Described as a living document but no updates past 2014 recorded.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Safe management of wastes from health-care activities, 2nd ed. 2014 [cited 15 September]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
The WHO provide guidance for labelling waste in health and scare settings. This WHO guidance provides guidance on safe handling and disposal of waste from health care globally, also addressing waste management options for developing countries. This second addition of 'The Blue Book' updates guidance from 2007. This guidance comprises of expert opinion from "internal consultation and collaboration" at a conference in 2007, with peer-review of each chapter from experts worldwide. Names of those who contributed to the first edition are provided in appendix 1. Target audience: "medical staff, health-care facility directors, ancillary health workers, infection-control officers and waste workers […] regulators, policy-makers, development organizations, voluntary groups, environmental bodies, environmental health practitioners, advisers, researchers and students" When waste containers are full, they should be labelled. Labels should include source, type of waste and quantity, medical area, date and time waste container was sealed and the name of the person filling out the label. The authors recommend an international hazard symbol on waste containers e.g. biohazard symbol. Waste bags and containers should be labelled with date, type of waste and where it was produced so that they can be located throughout the waste management process. **Limitations** • This guidance is from 2014 so some guidelines may be out of date

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Standards New Zealand. Management of Healthcare Waste. 2002 [cited 22 September 2023]	Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This New Zealand standard describes how waste containers should be labelled in health and care settings.

This New Zealand standard contains best practice guidance (beyond legislative requirements) on human and animal healthcare waste disposal including classification, segregation, packaging/containment, labelling, storage and transport, where healthcare waste refers to all waste produced by a healthcare facility.

These standards aim to assist compliance with regulations and best practice in healthcare waste management.

“Reusable rigid-walled containers” like “mobile garbage bins” should be colour coded and labelled according to source and contents.

Limitations

- From 2002 so may not be reflective of current best practice
- How best practice determined not clear
- Guidance for compliance with NZ legislation

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. Scottish Health Facilities Note 30 Part A: Manual. Information for Design Teams, Construction Teams, Estates & Facilities and Infection Prevention & Control Teams. 2014 [cited 04 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This SHFN provides guidance which addresses use of temporary labels in Scottish health and care settings. Scottish Health Facilities Note 30 (SHFN 30) Part A is considered the 'manual' within a series covering IPC best practice considerations in the built environment. Part B covers implementation and assessment and Part C contains question sets and checklists. Compliance is to guide fulfilment of mandatory requirements as per the NIPCM. This version (4.0) is the most recent update. The 'waste management' section sits within '5. Typical rooms: purpose and content'. "Disclaimer The contents of this document are provided by way of general guidance only at the time of its publication. Any party making any use thereof or placing any reliance thereon shall do so only upon exercise of that party's own judgement as to the adequacy of the contents in the particular circumstances of its use and application." It is advised that temporary label use on lids of waste receptacles for healthcare waste as this may inhibit cleaning and disinfection.					

Assessment of evidence
Health Facilities Scotland is within National Services Scotland and this guidance applies to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Government of Canada. Infection prevention and control measures for Ebola disease in acute care settings. 2023 [cited 07 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This Canadian Government guidance provides guidance for labelling waste receptacles containing Ebola waste. Aim: “guidance on the minimum level of IPC measures in healthcare settings in the event that a person under investigation for EBOD or patient with EVOD is identified within a Canadian healthcare facility” Appendix C in this Governmental guidance covers management of waste associated with suspected and confirmed cases of Ebola. Guidance is relevant to “facility and medical” waste management personnel, IPC, occupational health and safety and HCW educators and “environmental services personnel” who may manage Ebola-associated waste in Canada. Evidence used for development is stated as “currently available scientific evidence, standards and regulations” with consideration of gaps or inconclusive research where appropriate. This guidance should be updated in line with emerging evidence. This document does not include care and management of the deceased. It is stated that waste containers should be clearly labelled as “EBOD-associated biohazardous material”.

Assessment of evidence
These findings are specific to Ebola. This guidance presents minimum infection prevention and control measures for acute Canadian healthcare facilities. **Limitations** • A dedicated reference list for Appendix C is not provided and in-text citations are not used so it is unclear how evidence informed above guidance. • Reference list mainly contains guidance and other grey literature specific to Canadian healthcare settings, so the guidance did not consider primary literature. • This guidance presents minimum infection prevention and control measures for acute Canadian healthcare facilities. The authors state that these guidelines were developed based on Canadian settings so applicability to Scottish settings may be limited. • Much of the references are CDC and WHO but in text citations are not used so it is not clear where CDC/WHO citations has contribute to this guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England. Health Technical Memorandum 07-01: Safe and sustainable management of healthcare waste. 2022 [cited 23 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

HTM 07-01 provides labelling requirements for health and care-associated waste for compliance with UK legislation.

Health technical memoranda are described as “comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology” for healthcare delivery. This guidance targets safe and sustainable management of healthcare waste for all NHS Trusts, and laboratories and vet surgeries.

it is stated that this best practice guidance is not mandatory unless stated. Where authors have used this wording is indicated in the ETs by “”s. The authors provide the following guidance on these choices of wording:

- “must” for legal compliance
- “should” for a recommendation that is not mandatory
- “may” for permission

This guidance replaces the 2013 version, with the aim of supporting compliance with legislative changes and better capturing sustainability goals including the NHS Clinical Waste Strategy.

A list of contributors is provided, and a statement thanking those from the “scoping and technical engagement phases” indicating a consultation phase but not much detail is provided on how this guidance was formed, including no indication of systematic methods.

Target audience: those involved in NHS waste management (details on relevant sections by job role are signposted in Table 1, p.4), targeted towards compliance with English legislation and regulations so should not be “relied upon” by devolved nations.

To comply with English legislation, the following guidance is provided for handling clinical waste:

- Bags and sharps containers are labelled with ward or department

The following segregation guidance is provided for compliance with English legislation:

- “Healthcare products with hazardous properties, excluding medicines” “should” be clearly labelled with a detailed description e.g. “containing infectious pathogens (infectious wastes)”
- Regular training and written and visual reminders, colour-coded and labelled receptacles facilitate correct segregation

Assessment of evidence

- Container labels “should” reflect transportation and packaging legal requirements i.e. identify waste to deter improper handling
- Tags or labels “should” indicate ward and facility of waste origin (see duty of care)
- Bags “should” be labelled or tagged as well as containers because transport and handling can involve repackaging waste
- Where labelling/tagging of each waste bag is difficult in busy wards, pre-printed tags or stickers “may” be used
- Waste bags “must” be able to be traced back to the producer

The following transport and packaging guidance is provided for compliance with English legislation:

- Carriage Regulations outline packaging, marking, labelling and document requirements for healthcare organisations. Waste producers, in this case health facilities, should be sure that dangerous goods are labelled and packaged complying with the Carriage Regulations for off-site transport i.e. the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment (EU Exit) Regulations (2020). Carriage Regulations require dangerous goods to be labelled with a UN number, description and are assigned a dangerous goods class.
- Table 11 outlines common packaging UN numbers, shipping name and instructions for healthcare wastes under the ADR, with Tables 12 and 13 outlining the packaging instructions (UNECE’s 2020 Agreement concerning the International Carriage of Dangerous Goods by Road).

For ambulatory care, waste streams “should” be easily identifiable with clear labels depending on waste classification and requirements for management.

Waste descriptions are required to include a written description, appropriate EWC, and indication of quantity.

Limitations

- The Welsh HTM 07-01 is based on the old 2013 HTM 07-01. However, this current version is also linked out in NHS Wales web pages, so it is not clear if Welsh NHS boards are also to follow this guidance
- Unclear methodology and inconsistent in text citations used.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland Waste Management Guidance: Scottish Health Technical Note 03-01. Version 7.0. 2023 [updated 09 December 2024; cited 02 November 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

SHTN 03-01 describes labelling requirements for waste produced in health and care settings as per Scottish legislation.

This guidance aims to help boards in NHSScotland meet waste management legal, policy, procedural requirements and best practice in Scotland, applicable to NHSScotland healthcare services producing waste, superseding the SHTN 03-01 Parts A to D. It is stated that NHSScotland staff and contractors should not rely on the HTM 07-01 or UK-wide waste management guidance alone due to differing legal requirements across the UK.

Target audience: “staff and contractors involved at all stages of waste management in the modern healthcare setting”

Written by the NHSScotland Waste Management Steering Group. Member names and job titles are not provided.

Endorsed by SEPA.

A disclaimer is provided stating that the guidance is “general” and accurate at time of publication.

Assessment of evidence

Training and audit requirements are also described in chapters 14 and 15 respectively but are out-with the remit of this review.

Waste segregation and colour-coding:

It is stated that: “Segregation of waste at the point of production into suitable colour-coded and suitably labelled packaging is vital to good waste management”. Appropriate waste descriptions are a requirement under health and safety, carriage and waste legislations according to the authors.

The authors state that to support successful segregation, “it is important that staff be provided with the necessary equipment, including appropriate colour-coded and labelled waste receptacles and sack holders”

Transport:

- It is stated that the Carriage Regulations reference the ADR to address:
    - “[…]
    - substance clarification and identification
    - packaging
    - marking, labelling and documentation
    - […]”

Under the Duty of Care, The Landfill (Scotland) Regulations 2003 and the Special Waste Amendment (Scotland) Regulations 2004, producers should describe waste “adequately using both a written description and the use of appropriate EWC code(s)”

EWC by the European Commission alongside the “revised European Framework Directive (2008/98/EC)”, which provides common terminology for Europe. Includes the European Hazardous Waste List. The authors signpost to SEPA (2015) “Guidance on using the European Waste Catalogue to code waste”. The 2021 update of the WM3 is also signposted for special (hazardous) waste codes. Table 18 provides EWCs for healthcare waste.

Assessment of evidence
Classifying infectious waste for transport: • Waste contaminated with suspected or known pathogens with severe risk of infection fall under Category A waste, e.g. Ebola virus. Pathogen should be named. • Most infectious waste will fall under Category B Waste documentation, including transfer and consignment notes, should refer to the classifications and terminology used in the EWC. Systems to promote “successful” segregation of waste are described, including “appropriate equipment”: • “labelling of sacks to indicate their origin, for example by coding on the sack itself, by suitable permanent marker, by a label showing clearly the name of the hospital and the department, or by pre-printed self-adhesive labels or tape” Marking and labelling – labels should be used to state waste type within a package so that waste can be managed properly throughout the waste management process. Source of the waste should also be identified with a label or tag stating e.g. ward and date of waste production. “Traceability is also a requirement of the waste contractors Pollution Prevention and Control (PPC) Permit and failure to provide this may lead to waste being rejected”. “The Carriage Regulations specify the requirements for packaging, marking and labelling of dangerous goods.” For waste being moved, “the consignor must ensure that they use both the appropriate ‘waste’ and ‘carriage’ classifications and descriptions.”; “The Regulations require that all dangerous goods be identified using a four-digit number (United Nations (UN) number) and a description (proper shipping name) and are assigned to a ‘class’ of dangerous goods”. “Marking is the application of the relevant UN number and, where necessary, the proper shipping name onto the package.”; “Labelling is the application of the label (commonly referred to as the hazard warning diamond) appropriate to the class of dangerous goods and including any ancillary labels (such as any secondary hazard markings, orientation arrows”.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009. 2009 [cited 12 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 and HTM 07-01 as applicable to marking and labelling waste in Scottish health and care settings (see above entries). In the Explanatory Note, it is stated that “These Regulations impose requirements and prohibitions in relation to the carriage of dangerous goods by road and by rail and, in so far as they relate to safety advisers, by inland waterway. In doing so they implement certain Directives as respects Great Britain” and “First, the Regulations implement Directive 2008/68/EC of the European Parliament and of the Council of 24th September 2008 on the inland transport of dangerous goods”					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Pollution Prevention and Control (Scotland) Regulations 2012 2012 [cited 15 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence
This legislation is signposted in SHTN 03-01 as applicable to traceability of waste in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that “These Regulations provide an integrated pollution control regime for Scotland for the purposes of implementing Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control)”

Evidence from previous update(s)

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Environmental Protection (Duty of Care) (Scotland) Regulations 2014. 2014 [cited 12 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 as applicable to labelling waste in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that “Section 34(1) of the Environmental Protection Act 1990 (“the 1990 Act”) imposes a duty on any person who imports, produces, keeps or manages controlled waste, or who as broker or dealer has control of such waste, to take such measures on the transfer of the waste as are reasonable in the circumstances to secure that there is transferred with the waste such a written description of the waste as will enable other persons to avoid a contravention of any duty under that section or under section 33 of the 1990 Act.”					

Assessment of evidence
Regulation 3 states that “(1) The transferor and the transferee must ensure that a document as described in paragraphs (3) and (4) is completed in writing and signed by each of them in respect of the waste being transferred (“a transfer note”). (2) A transfer note must be prepared at the same time as the written description is transferred in accordance with section 34(1)(c) of the Act. (3) A transfer note must— (a) give the name and address (including the postcode) of the transferor and the transferee; (b) give the date and place (including the postcode) of the transfer; (c) state whether the transferor is the producer of the waste; (d) state whether the transferor is the importer of the waste; (e) describe the type, composition and quantity of the waste being transferred (including, where the waste is in a container, the type of container); (f) identify the waste being transferred by reference to the appropriate six-digit code in the European Waste Catalogue; and (g) identify the activity carried out by the transferor in respect of the waste being transferred by reference to the SIC code for that activity.” Regulation 4 states that “Regulation 3 does not apply where— (a) the waste transferred is special waste within the meaning of the Special Waste Regulations 1996(13); and (b) a consignment note (and if appropriate schedule) is completed and dealt with in accordance with those Regulations.” Regulation 5 states that “The transferor and the transferee must keep the written description and the transfer note (or copies of them) for a period of two years from the date of transfer of the waste.” Regulation 6 states that “(1) A competent authority may request any person required to keep a written description, or a transfer note under regulation 5, to produce the description or note (or a copy) to that authority. (2) The person must produce the description or note (or the copy) as soon as is reasonably practicable, and in any case— (a) within 7 days from the date of the request; or (b) such longer period as

Assessment of evidence
is permitted by that authority. (3) The description or note (or copy) must be— (a) given to an officer of that authority; or (b) sent to the address specified by that authority when making the request. (4) In this regulation, “competent authority” means — (a) the Scottish Environment Protection Agency; or (b) a waste collection authority for the purposes of Part 2 of the Act(14).” Applicability of this legislation in health and social care settings is described in the SHTN waste management guidance.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Sunley K, Gallagher R, Reidy MP, et al. Essential Practice for Infection Prevention and Control - Guidance for nursing staff. London: Royal College of Nursing, 2017	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This RCN guidance provides best practice points to support safe sharps disposal, including labelling requirements. This document produced by the Royal College of Nursing is practice guidance based on evidence-based consensus to influence care decisions, with a focus on good infection prevention and control practices. Under “Safe handling and disposal of sharps”:					

Assessment of evidence
Sharps are defined as encapsulating “needles, scalpels, stitch cutters, glass ampoules, bone fragments and any sharp instrument”, presenting risk of blood borne virus if a sharps injury occurs. An example of sharps injuries from sharps being put in waste bins is provided. Therefore, sharps should be disposed of safely according to local policy. As such, the authors provide “best practice points” for sharps use: • Sharps boxes should labelled and dated when assembled and disposed **Limitations** • This document was due to be updated in November 2020 but has not been

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health and Health Protection Agency. Prevention and control of infection in care homes – an information resource 2013 [cited 03 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This UK care home guidance addresses labelling of clinical waste.					

Assessment of evidence
Best practice infection prevention and control guidance for staff caring for residents in care homes in England and should be read in conjunction with “The Health and Social Care Act 2008: Code of Practice on the prevention and control of infections and related guidance”. The authors state that not all of the guidance will be applicable to all care homes. Target audience: “Care Trust CEs, GPs, Communications Leads, Consultants in Communicable Disease Control, Community Infection Control Nurses, Health Protection Nurses, Care Home Managers, Care Quality Commission” Under Part 3 that addresses “Basic infection prevention and control practices” i.e. Protocols that should be applied by all care workers at all times to reduce likelihood of infection: • Clinical waste should be “secured in an approved way and identified with a coded tie or label to indicate source of waste” **Limitations** • For waste management, the bibliography references the DoH Safe management of healthcare waste guidance which is now archived

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
British Standards Institution. BS EN ISO 23907-1:2019 Sharps injury protection - Requirements and test methods - Single-use sharps containers. 2019	British Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This British Standard provides labelling and marking requirements for single use sharps containers. BS EN ISO 23907-1:2019 “specifies requirements for single-use sharps containers intended to hold potentially hazardous sharps medical waste with or without sharps protection features, e.g. scalpel blades, trocars, hypodermic needles and syringes.” Applies to both assembled and unassembled single-use sharps containers but not to reusable containers or sharps “containers used in the transportation of filled single-use sharps containers.” Section 6 – labelling and marking Labelling and marking “essential for safe use shall be visible and easily legible” and will contain the following: • clear indication of fill line • word ‘DANGER’ • specific use such as chemotherapy or biohazard • indication as single-use • indication of “total and/or fill volume” • name and address of manufacturer • “lot or batch identification” • “commercial reference” • “packaging information” • warning against overfilling or forcing sharps • “”Use with secondary stabilizer”, when the container is designed for use with a secondary stabilizer.” Labelling may be on instructions for use for containers with a capacity of 0.6l or less due to surface area.

Assessment of evidence
Rationale for the standards are in Annex A.

Question 10: How should waste be transported in health and care settings?

Evidence added to Literature Review V5.0

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Scottish Government. Duty of Care – A Code of Practice 2012 [cited 25 August 2023]	Statutory guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This Scottish Government Code of Practice provides guidance for waste producers to support compliance with legislation, including for transportation. This statutory guidance document produced by the Scottish Government outlines duties for controlled waste producers, keepers, importers and/or managers in Scotland under Section 34 of the Environmental Protection Act 1990 (as amended). Published in 2012 but has regulatory requirements for 2014 onwards, in line with the implementation of The Environmental Protection (Duty of Care) (Scotland) Regulations 2014. The authors explain that this document is intended to address waste management based on a person's role in the Duty of Care.					

Assessment of evidence
Waste producer obligations A waste producer is “any person (with the exception of an occupier of domestic property in respect of waste produced on that property) who produces waste in the course of their activities”, and the authors state that they have the most important role in waste management, as they are best suited to describe the waste accurately, and therefore its’ safe management through the latter stages of the waste management process. To comply with Section 34, “as a waste producer, you must:” • “Describe the waste accurately and provide information for the safe handling, transport, treatment, recovery or disposal by subsequent holders.” **Limitations** • Not health and social care specific • Large focus on recycling/repurposing – Zero Waste Plan • Not focused on IPC or infectious waste

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Control and Prevention. Procedures for Safe Handling and Management of Ebola-Associated Waste	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
2022 [cited 08 September 2023]					
Assessment of evidence					
This CDC guidance provides guidance for transportation of Ebola-contaminated waste in health and care settings. This CDC guidance aims to provide detailed protocols to be read in conjunction with the CDC guidance on “Ebola-Associated Waste Management”. It is stated that this guidance is applicable to Ebola Disease and Marburg Virus Disease, and the page is currently being reviewed so the terminology used is true to this. Target audience: “Hospital infection control, occupational health systems, and facility medical waste managers and personnel” Under “Secondary Packaging and Removal of Waste”: It is stated that the double-bagged disinfected waste bag should then be placed in a “designated transport cart (for onsite inactivation or a rigid outer receptacle (with absorbent material and liner as described above, for offsite inactivation)” For onsite inactivation – those wearing the appropriate PPE should transfer the waste in a transport cart to the autoclave room or secure storage.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Control and Prevention. Guidance on Personal Protective Equipment (PPE) in U.S. Healthcare	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Settings during Management of Patients Confirmed to have Selected Viral Hemorrhagic Fevers or Patients Suspected to have Selected Viral Hemorrhagic Fevers who are Clinically Unstable or Have Bleeding, Vomiting, or Diarrhea. 2023 [cited 08 September 2023]					

Assessment of evidence

This CDC guidance provides guidance regarding transportation of EVD/MVD contaminated waste in health and care settings.

This CDC guidance aims to provide PPE protocols for IPC for those caring for patients with Ebola or those who are clinically unstable with suspected Ebola, e.g. bleeding, vomiting and diarrhea. It is stated that this guidance is applicable to Ebola Disease and Marburg Virus Disease, and the page is currently being reviewed so the terminology used is true to this.

Target audience: Healthcare workers and administrators for US healthcare settings

Contaminated waste should not be transported through PPE storage or donning area, unless it is sufficiently contained.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Safe management of wastes from health-care activities, 2nd ed. 2014 [cited 15 September]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

The WHO provide guidance regarding transportation of waste in health and care settings.

This WHO guidance provides guidance on safe handling and disposal of waste from health care globally, also addressing waste management options for developing countries. This second addition of 'The Blue Book' updates guidance from 2007.

This guidance comprises of expert opinion from "internal consultation and collaboration" at a conference in 2007, with peer-review of each chapter from experts worldwide. Names of those who contributed to the first edition are provided in appendix 1.

Target audience: "medical staff, health-care facility directors, ancillary health workers, infection-control officers and waste workers […] regulators, policy-makers, development organizations, voluntary groups, environmental bodies, environmental health practitioners, advisers, researchers and students"

Under the proximity principle, "treatment and disposal of hazardous waste take place at the closest possible location to its source to minimize the risks involved in its transport"

Hazardous and non-hazardous waste should be segregated when collected, transported and stored.

Times for waste collection should be set and according to amount of waste produced. Hazardous waste should not be collected at the same time as infectious or hazardous waste, nor placed on the same trolley.

Assessment of evidence

Most waste should be collected daily according to when waste production is highest.

Transport onsite should be during less busy periods. Routes should be planned to minimise exposure to staff and patients and movement of waste through clinical areas. Where possible, waste should be transported using “separate floors, stairways or elevators”. Routes used and times for waste collection should be reliable.

When transporting waste, staff should wear “adequate personal protective equipment, gloves, strong and closed shoes, overalls and masks”.

Hazardous and non-hazardous waste should be transported separately, where general waste transportation trolleys are black and only used for non-hazardous waste, clearly labelled with “General waste” or “Non-hazardous waste”. Infectious waste can be transported with sharps waste in yellow trolleys to signify infectious waste and labelled as such, but should not be transported with other hazardous waste. Chemical and pharmaceutical wastes should be transported separately.

Waste chutes are not recommended to reduce risk of airborne transmission.

Trolleys for transporting healthcare waste should have wheels and not be used for any other purposes. The following specifications are provided:

- Easily loaded/unloaded
- No sharp edges to damage waste receptacles (during loading/unloading)
- Easily cleaned
- Enclosed trolleys should have drainage hole and plug
- Trolleys should assigned to a waste type and labelled as such
- Trolleys or carts should be easy to maneouvre
- Height should not restrict staff view when transporting
- Hazardous waste trolleys should be lockable

Assessment of evidence

- Trolleys should be sized relative to volume of waste produced

Waste should not be transported by hand to avoid risk of injury or improperly segregated sharps, especially hazardous waste.

Spare trolleys should be available.

After transportation of waste, the seals of waste receptacles should be checked to confirm that they are in tact.

Routes should be separate for hazardous and non-hazardous waste and planned ahead. The authors describe the “from clean to dirty” principle, wherein waste should first be collected from the “most hygienically sensitive medical areas” like ICUs, dialysis units and theatres. Waste should be collected often enough so that containers are not left to overflow.

Infectious waste should be collected at least once a day.

A route for waste collection should be influenced by volume of waste, number of bags or containers, type of waste, capacity of waste storage, trolley capacity, distance and journey time.

In summary, as a minimum:

- “General waste and infectious health-care waste is collected separately and at least once a day.
- Collection is at regular times and is reliable.
- Waste containers and onsite transport trolleys are closed with lids to isolate wastes from patients and the public.
- Where wastes are transported offsite for disposal, the vehicle is able to carry wastes in a closed or covered container, and the driver knows what to do if there is an accident or incident during transportation on public roads.
- Transport staff are vaccinated at least against hepatitis A and B, polio and tetanus.
- Waste containers, trolleys and vehicles are maintained and cleaned regularly.”

The following points are suggested to be covered in training for those transporting waste:

- “Follow correct procedures for handling, loading and unloading colour-coded waste bags and containers.

Assessment of evidence
• Be aware of the correct procedures for dealing with spillages or other accidents, and be aware of established, usually written, instructions for these procedures. • Use protective clothing and strong footwear at all times. • Ensure the availability of dedicated waste-collection vehicles, spare plastic bags, protective clothing, cleaning tools and disinfectants to deal with any spillage that occurs during loading, transport or unloading. • Document health-care waste inside a health-care facility and, if carried offsite, be aware of how a consignment note system operates to track waste from its point of generation to its final place of disposal" Those transporting and handling waste should also be aware of the hazards associated with the waste they're handling. **Limitations** • This guidance is from 2014 so some guidelines may be out of date

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Infection prevention and control guideline for Ebola and Marburg disease 2023 [cited 10 November 2023]	Guideline	**AGREE II Recommend with Modifications**	N/A	N/A	N/A

Assessment of evidence

This WHO guideline considers transportation of EVD/MVD waste in the context of considerations for treating infectious waste.

Guideline “provides IPC recommendations for Ebola and Marburg disease outbreaks” with a healthcare focus and wider consideration of community settings. These recommendations should be followed during readiness or response activities. Core and development team members and affiliations are listed, including methodology experts. New evidence should result in updates (no timeline provided). Previous update recommendations have been incorporated alongside new evidence and a distinction made where appropriate. Intended audience: “policy-makers, health-care administrators and managers, IPC specialists, logisticians, community workers, burial teams and all health and care workers.”

Methods: a “guideline development group” made of diverse backgrounds and an “external peer-review group” were involved in the review and consultation process. GRADE was used to appraise appropriate evidence. Systematic reviews from previous updates were summarised and their recommendations incorporated where appropriate. This 2023 update involved a series of studies: systematic review, rapid reviews, scoping review and mixed methods study. The systematic review was used for an AGREE II appraisal and graded AGREE Recommend with Modifications, based on ARHAI criteria.
Under the good practice point relating to how Ebola/Marburg-associated waste should be treated, the following is stated in the considerations for implementation: “Where possible, transportation of infectious waste is discouraged. If transportation is required, then appropriate IPC precautions should be followed to prevent infection in those transporting the waste.”

Limitations

- These are global recommendations and will be applicable to Scottish health and care settings if there were an outbreak of Ebola virus or Marburg disease.
- Poor distinction between methodologies and findings of each development process different studies carried out.
- Poor reporting of search strategies, time ranges and inclusion/exclusion criteria.
- Poor description of populations likely influenced by the content of these guidelines.
- No statement of influence of funding bodies.
- Tools are yet to be published.

Assessment of evidence
• Timeline and methods for update are not provided.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Standards New Zealand. Management of Healthcare Waste. 2002 [cited 22 September 2023]	Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This New Zealand Standard provides guidance for transportation of healthcare waste. This New Zealand standard contains best practice guidance (beyond legislative requirements) on human and animal healthcare waste disposal including classification, segregation, packaging/containment, labelling, storage and transport, where healthcare waste refers to all waste produced by a healthcare facility. These standards aim to assist compliance with regulations and best practice in healthcare waste management. Waste collection is defined as “the aggregation of waste from primary sources of storage areas for movement to a waste holding area or from waste holding areas for movement to pre-disposal storage”. A waste transporter is the term used to refer to “a person or organisation” transporting healthcare waste. “Reusable rigid-walled containers” like “mobile garbage bins” should be leak, rupture and corrosion resistant. Containers should be checked after use to ensure they are clean and have not been damaged. Any damage should be repaired before next use. Inner walls of

Assessment of evidence
containers should be “smooth, impervious” for containing spills. These containers should be colour coded. These containers should be labelled according to source and contents. The following guidance is provided for moving healthcare waste: • Only securely closed waste bags should be moved • Hazardous, non-hazardous and controlled waste should remain segregated and if it is mixed or loses its’ label throughout the transport process it should be treated as the highest risk waste. • Transport containers should remain securely shut • Hazardous and controlled waste trolleys should be leak-proof • Waste should not be taken through clinical areas or restricted to times of low-traffic • Routes should be “well lit, easy to traverse, and (where possible) kept separate from supply routes” • Hazardous and controlled waste being moved will not be left unattended where they can be accessed by the public Waste tracking systems to ensure successful transport and disposal are described. Transporters’ responsibilities are described but it is not clear if these apply within the healthcare setting or beyond. As such, transportation vehicles should be dedicated to waste transportation with a separate compartment for waste. Further transportation vehicle requirements are provided (p.28-29) **Limitations** • From 2002 so may not be reflective of current best practice • How best practice determined not clear • Guidance for compliance with NZ legislation

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Government of Canada. Infection prevention and control measures for Ebola disease in acute care settings. 2023 [cited 07 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This Canadian guidance details considerations for transporting Ebola patient waste in acute care settings.

Aim: “guidance on the minimum level of IPC measures in healthcare settings in the event that a person under investigation for EBOD or patient with EVOD is identified within a Canadian healthcare facility”

Appendix C in this Governmental guidance covers management of waste associated with suspected and confirmed cases of Ebola. Guidance is relevant to “facility and medical” waste management personnel, IPC, occupational health and safety and HCW educators and “environmental services personnel” who may manage Ebola-associated waste in Canada. Evidence used for development is stated as “currently available scientific evidence, standards and regulations” with consideration of gaps or inconclusive research where appropriate. This guidance should be updated in line with emerging evidence. This document does not include care and management of the deceased.

- Waste being passed through ‘clean’ areas e.g. PPE storage and PPE donning areas should be “properly contained”
- Non-sharps waste being transported should only be handled by the outer container and transport carts. Guard rails or raised edges should be used for large or heavy containers, with carts disinfected between uses.

Assessment of evidence
Limitations • A dedicated reference list for Appendix C is not provided and in-text citations are not used so it is unclear how evidence informed above guidance. • Reference list mainly contains guidance and other grey literature specific to Canadian healthcare settings, so the guidance did not consider primary literature. • This guidance presents minimum infection prevention and control measures for acute Canadian healthcare facilities. The authors state that these guidelines were developed based on Canadian settings so applicability to Scottish settings may be limited. • Much of the references are CDC and WHO but in text citations are not used so it is not clear where CDC/WHO citations has contribute to this guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England. Health Technical Memorandum 07-01: Safe and sustainable management of healthcare waste. 2022 [cited 23 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
HTM 07-01 provides guidance for transportation of waste for best practice and compliance with UK legislation.					

Assessment of evidence

Health technical memoranda are described as “comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology” for healthcare delivery. This guidance targets safe and sustainable management of healthcare waste for all NHS Trusts, and laboratories and vet surgeries.

it is stated that this best practice guidance is not mandatory unless stated. Where authors have used this wording is indicated in the ETs by “”s. The authors provide the following guidance on these choices of wording:

- “must” for legal compliance
- “should” for a recommendation that is not mandatory
- “may” for permission

This guidance replaces the 2013 version, with the aim of supporting compliance with legislative changes and better capturing sustainability goals including the NHS Clinical Waste Strategy.

A list of contributors is provided, and a statement thanking those from the “scoping and technical engagement phases” indicating a consultation phase but not much detail is provided on how this guidance was formed, including no indication of systematic methods.

Target audience: those involved in NHS waste management (details on relevant sections by job role are signposted in Table 1, p.4), targeted towards compliance with English legislation and regulations so should not be “relied upon” by devolved nations.

The following transport and packaging guidance is provided for compliance with English legislation:

- Carriage Regulations outline packaging, marking, labelling and document requirements for healthcare organisations. Waste producers, in this case health facilities, should be sure that dangerous goods are labelled and packaged complying with the Carriage Regulations for off-site transport i.e. the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment (EU Exit) Regulations (2020). Carriage Regulations require dangerous goods to be labelled with a UN number, description and are assigned a dangerous goods class. Healthcare waste that’s classed as dangerous goods can be transported in packaging (e.g. boxes or drums) or as “bulk loose material in skips, containers and vehicles”. The authors signpost to HSE’s Carriage of Dangerous Goods Manual, the Vehicle Certification Agency’s website and the Department of Transport’s website.

Assessment of evidence

- Bulk transport is also described
- Offensive waste is not covered by ADR requirements and can be transported in non-UN packaging. As such, offensive and pharmaceutical waste should not be transported in bins labelled “Class 6.2, UN 3291”. These waste carts should be visually inspected after waste is removed. Offensive waste can be compacted for transport to increase load capacity unless stated otherwise in the environmental permit
- Road transport of dangerous goods under the Carriage Regulations are described, including exemptions based on quantity (see Table 16), requirements for loads above the threshold (PPE and fire extinguishers), vehicle markings and driver training. Waste bags >15kg should not be placed directly into a vehicle (derogation 17 of the ADR), but in a “rigid, secure and leak-proof outer packaging duly approved for the purpose”, and those caring for patients in the community should be trained in this type of transportation of waste.
- With regard to transport on site, the following guidance is provided:
    - Dedicated trucks, trolleys, tugs or wheelie bins may be used to transport waste and receptacles to storage on non-publicly accessible roads. These roads should only be used for these purposes.
    - These service roads should be easy to clean and drain, contain leaks in case of receptacle damage, allow easy loading and unloading, be insect and vermin free and be free of crevices for waste to congregate.
    - It is stated that on-site transportation containers should be steam cleaned or disinfected regularly and when spills have occurred. Any liquid waste from infectious waste containers “must” be captured. Where there is not dedicated space for cleaning infectious waste carts, a contractor may be used. The authors differentiate between carts used for transporting infectious waste and offensive waste.
    - Unless “internal vehicles (or equipment)” meet the standards of the Carriage Regulations, they “should not be used to transport waste materials on roads to which the public have access”.
    - Under the ADR road derogation 11, class 2, 3, 4, 5, 6, 8 and 9 materials can be transported on private premises by road without having to meet the Carriage Regulation requirements.

Assessment of evidence
With regard to clinical waste – “damaged or leaking bags must not be moved until the complete bag is placed inside a new bag”. Ambulatory services “should” follow community healthcare guidance for classifying, transporting and disposing of waste. Waste to be transported “should” be securely packaged. Dangerous goods with a maximum weight of 15kg. **Limitations** • The Welsh HTM 07-01 is based on the old 2013 HTM 07-01. However, this current version is also linked out in NHS Wales web pages, so it is not clear if Welsh NHS boards are also to follow this guidance. • Unclear methodology and inconsistent in text citations used.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland Waste Management Guidance: Scottish Health Technical Note 03-01. Version 7.0. 2023 [updated 09 December 2024; cited 02 November 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

SHTN 03-01 describes requirements for transportation of waste in and out-with Scottish health and care settings for compliance with Scottish legislation and in accordance with best practice.

This guidance aims to help boards in NHSScotland meet waste management legal, policy, procedural requirements and best practice in Scotland, applicable to NHSScotland healthcare services producing waste, superseding the SHTN 03-01 Parts A to D. It is stated that NHSScotland staff and contractors should not rely on the HTM 07-01 or UK-wide waste management guidance alone due to differing legal requirements across the UK.

Target audience: “staff and contractors involved at all stages of waste management in the modern healthcare setting”

Written by the NHSScotland Waste Management Steering Group. Member names and job titles are not provided.

Endorsed by SEPA.

A disclaimer is provided stating that the guidance is “general” and accurate at time of publication.

Training and audit requirements are also described in chapters 14 and 15 respectively but are out-with the remit of this review.

Safe transport of waste is required under health and safety, carriage and waste regulations.

Transport:

- The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 – “subject to regulatory control”. “intended to reduce to reasonable levels the risk of harm or damage to people, property and the environment posed by the carriage of dangerous goods.”, where dangerous goods are “substances with intrinsic hazards posing a potential risk to persons or the environment while in the transport chain.” Do not regulate waste materials specifically but rather all dangerous goods depending on hazardous characteristics and classification (nine classes) which then influences packaging, labelling and transport requirements. Table 1.1. describes these nine UN classifications, hazard warning label and examples specific to healthcare
- It is stated that the Carriage Regulations reference the ADR to address:
    - “training of personnel involved in the chain of distribution
    - substance clarification and identification

Assessment of evidence
○ packaging ○ marking, labelling and documentation ○ safety equipment and emergency procedures ○ safe loading ○ vehicle specification and operation” Classifying infectious waste for transport: • Hygiene and sanpro waste are not considered infectious so not classed as dangerous goods Systems to promote “successful” segregation of waste are described, including “appropriate equipment”: • “appropriate frequency” of waste collection Waste collection: • “Where waste accumulates in small quantities daily, the interval between collections should be as short as reasonably practicable” • “With regard to infectious waste, excluding sharps, the collection period should be no less than once a week, unless the waste is refrigerated” • “It is recommended that sharps receptacles are exchanged at regular intervals of no less than three months.” • It is not clear if this refers to waste collection at ward-level or department-level • “Arrangements should be made to transport waste routinely from ward level to a storage area pending collection by a waste contractor.” Regarding receptacle cleaning, “Transport regulations require that no dangerous goods residue shall adhere to the outside of packaging. If any dangerous substances adhere to the inside of a receptacle, the receptacle, even though nominally empty, must continue to be treated as dangerous goods.”; “It is important that local waste policies include a cart-cleaning procedure, clearly specifying frequency and monitoring of the cleaning process to avoid the potential for cross-contamination between sites (uncleaned carts are stilled classed as

Assessment of evidence
dangerous goods).”; “The cleaning procedure should ensure that drainage bungs are properly replaced after cleaning and that missing bungs are replaced to prevent leakage of waste liquids.” “On roads to which the public do not have access, dedicated trucks, trolleys, tugs or wheeled containers can be used to transport waste receptacles to storage areas. To prevent contamination, they should not be used for any other purpose. They need to be designed and constructed so that they: • are easy to clean and drain • contain any leakage from damaged receptacles or containers • are easy to load and unload • do not offer harbourage for insects or vermin • do not allow particles of waste to become trapped on edges or crevices” “Containers for on-site transport need to be steam-cleaned or disinfected following leakages or spills, and at regular intervals. If containers are heavily used, cleaning is likely to be required at least weekly. The healthcare waste procedures need to specify the method and frequency of steam cleaning or disinfection. 8.3. Internal vehicles should not be used to transport waste materials on roads to which the public have access unless they meet the full provisions of the Carriage Regulations as appropriate.” External transportation requirements under the Carriage Regulations are described, including bulk transportation of infectious waste (p.66) Transportation documentation requirements under the Carriage regulations are described (p.80). Consignment notes are a requirement for special (hazardous) waste under the Special Waste Regulations. Under COSHH, PPE is required for staff transporting healthcare waste. Risk assessment should be undertaken by employers to determine the required PPE.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. Scottish Health Facilities Note 30 Part A: Manual. Information for Design Teams, Construction Teams, Estates & Facilities and Infection Prevention & Control Teams. 2014 [cited 04 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

SHFN 30 provides guidance which addresses waste collection in Scottish health and care settings.

Scottish Health Facilities Note 30 (SHFN 30) Part A is considered the 'manual' within a series covering IPC best practice considerations in the built environment. Part B covers implementation and assessment and Part C contains question sets and checklists. Compliance is to guide fulfilment of mandatory requirements as per the NIPCM. This version (4.0) is the most recent update. The 'waste management' section sits within '5. Typical rooms: purpose and content'. "Disclaimer The contents of this document are provided by way of general guidance only at the time of its publication. Any party making any use thereof or placing any reliance thereon shall do so only upon exercise of that party's own judgement as to the adequacy of the contents in the particular circumstances of its use and application."

Assessment of evidence
For healthcare waste: • "In healthcare facilities such as care homes and primary care settings, all waste should be contained appropriately and kept secure at all times." • "There should be a strict routine for removing waste to ensure it does not remain uncollected for extended periods." Health Facilities Scotland is within National Services Scotland and this guidance applies to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Control of Substances Hazardous to Health Regulations 2002 2002 [cited 24 August 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 as applicable to transporting waste in UK health and care settings (see above entry). In the Explanatory Note, it is stated that "These Regulations re-enact, with modifications, the Control of Substances Hazardous to Health Regulations 1999 (S.I. 1999/437) ("the 1999 Regulations"). The 1999 Regulations imposed duties on employers to protect employees and other persons who may be exposed to substances hazardous to health and also imposed certain duties on employees concerning their own protection from such exposure, and prohibited the import into the United Kingdom of certain substances and articles from outside the European Economic Area." Regulation 7 Prevention or control of exposure to substances hazardous to health; COSHH requires that:					

Assessment of evidence
1. “Every employer shall ensure that the exposure of his employees to substances hazardous to health is either prevented or, where this is not reasonably practicable, adequately controlled.” 3. “Where it is not reasonably practicable to prevent exposure to a substance hazardous to health, the employer shall comply with his duty of control under paragraph (1) by applying protection measures appropriate to the activity and consistent with the risk assessment, including, in order of priority - (a) The design and use of appropriate work processes, systems and engineering controls and the provision and use of suitable work equipment and materials; (b) the control of exposure at source, including adequate ventilation systems and appropriate organisational measures; and (c) where adequate control of exposure cannot be achieved by other means, the provision of suitable personal protective equipment in addition to the measures required by sub-paragraphs (a) and (b).” 4. “The measures referred to in paragraph (3) shall include - (a) arrangements for the safe handling, storage and transport of substances hazardous to health, and of waste containing such substances and be provided with appropriate hygiene measures including adequate washing facilities at the workplace.”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHSScotland. Scottish Health Technical Memorandum 83. Fire safety in healthcare premises	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
- General fire precautions April 2004 [cited 04 October 2023]					
Assessment of evidence					
This SHTM makes reference to waste disposal chutes used in Scottish health and care settings. This is guidance that covers general fire precautions in healthcare settings. Waste is covered under 'waste disposal and collection' from 3.16. "Disclaimer The contents of the various documents comprising NHS in Scotland Firecode are provided by way of guidance only. Any party making any use thereof or placing any reliance thereon shall do so only upon exercise of that party's own judgement as to the adequacy of 'Firecode' in the particular circumstances of its use and application." "Waste disposal chutes, where provided, should be maintained under constant supervision. Any redundant chutes which connect basement zones with floors above may constitute a serious fire and smoke risk and must be sealed off in the basement, and at each floor level, with fire- and smoke-resisting seals." This guidance is still recommended for use, but as it is from 2004 some references may be outdated.					

Evidence from previous update(s)

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. The Control of Substances Hazardous to Health Regulations 2002 (as Amended) Approved Code of Practice and Guidance. 2013 [cited 24 August 2023]	Guidance for legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This COSHH code of practice provides guidance regarding legislative requirements relevant to transporting waste. This document by HSE provides methods for compliance with the Control of Substances Hazardous to Health Regulations 2002 (as amended) (COSHH). List of amendments on p.5, including Control of Substances Hazardous to Health (Amendment) Regulations 2004 (SI 2004/3386). The target audience is duty holders and health and safety professionals. Regulation 2 Interpretation Biological agent is described as “a micro-organism, cell culture, or human endoparasite, whether or not genetically modified, which may cause infection, allergy, toxicity or otherwise create a hazard to human health” (p.7). biological agents are among a list of substances described as being hazardous to health (p.9)					

Assessment of evidence
Hazard “in relation to a substance” is described as “the intrinsic property of that substance which has the potential to cause harm to the health of a person, and “hazardous” shall be construed accordingly” (p.8) Risk is defined as “in relation to the exposure of an employee to a substance hazardous to health, means the likelihood that the potential for harm to the health of a person will be attained under the conditions of use and exposure and also the extent of that harm” (p.8) Guidance: • HSE guidance states that “COSHH applies to a wide range of substances and preparations (mixtures of two or more substances) which have the potential to cause harm to health if they are ingested, inhaled, or are absorbed by, or come into contact with, the skin, or other body membranes”. • It is stated that biological agents that come under COSHH as substances hazardous to health include: “micro-organisms such as bacteria, viruses, fungi, and the agents that cause transmissible spongiform encephalopathies (TSEs)”; “cell cultures, if the cell being cultured is itself hazardous”; and “parasites that live inside their host, including single-cell organisms, eg malarial parasites, amoebae and trypanosomes and the microscopic infectious forms of larger parasites, eg the microscopic ova and infectious larval (helminths)” • COSHH covers employee exposure to biological agents at work, for example through contact with blood and body fluids. Regulation 7 Prevention or control of exposure to substances hazardous to health COSHH requires that: 1. “Every employer shall ensure that the exposure of his employees to substances hazardous to health is either prevented or, where this is not reasonably practicable, adequately controlled.” 3. “Where it is not reasonably practicable to prevent exposure to a substance hazardous to health, the employer shall comply with his duty of control under paragraph (1) by applying protection measures appropriate to the activity and consistent with the risk assessment, including, in order of priority -

Assessment of evidence
(a) The design and use of appropriate work processes, systems and engineering controls and the provision and use of suitable work equipment and materials; (b) the control of exposure at source, including adequate ventilation systems and appropriate organisational measures; and (c) where adequate control of exposure cannot be achieved by other means, the provision of suitable personal protective equipment in addition to the measures required by sub-paragraphs (a) and (b).” 4. “The measures referred to in paragraph (3) shall include - (a) arrangements for the safe handling, storage and transport of substances hazardous to health, and of waste containing such substances and be provided with appropriate hygiene measures including adequate washing facilities at the workplace.” 6. “Without prejudice to the generality of paragraph (1), where it is not reasonably practicable to prevent exposure to a biological agent, the employer shall apply the following measures in addition to those required by paragraph (3) – (a) displaying suitable and sufficient warning signs, including the biohazard sign shown in Part IV of Schedule 3;” “(c) instituting means for the safe collection, storage and disposal of contaminated waste, including the use of secure and identifiable containers, after suitable treatment where appropriate;” “(e) specifying procedures for working with, and transporting at the workplace, a biological agent or material that may contain such an agent” 7, “Principles of good practice for the control of exposure to substances hazardous to health”: “Design and operate processes and activities to minimise emission, release and spread of substances hazardous to health. (b) Take into account all relevant routes of exposure – inhalation, skin absorption and ingestion – when developing control measures. (c) Control exposure by measures that are proportionate to the health risk. (d) Choose the most effective and reliable control options which minimise the escape and spread of substances hazardous to health.

Assessment of evidence
(e) Where adequate control of exposure cannot be achieved by other means, provide, in combination with other control measures, suitable personal protective equipment. (f) Check and review regularly all elements of control measures for their continuing effectiveness. (g) Inform and train all employees on the hazards and risks from the substances with which they work and the use of control measures developed to minimise the risks. (h) Ensure that the introduction of control measures does not increase the overall risk to health and safety” ACOP: • The authors explain that employers should firstly consider hazardous substance exposure in terms of eliminating these substances hazardous to health. Where this is not possible, options for reducing exposure should be considered. Where hazardous substance exposure cannot be prevented, employers should apply regulations 7(3) and 7(4) (p.29) • “The employer should consider the way employees will use the controls when making decisions about their design, installation and use. […] Employers should also consider the arrangements for the safe handling, storage and transport of hazardous substances, of waste containing such substances, and suitable maintenance procedures etc.” • For control of biological agent exposure, employers should “adequately” control exposure (see 7(3-7)), not all regulation 7(6) measures will be requited for “incidental” exposure, and if vaccines are readily available, they should be offered • PPE may be required if good practice is not sufficient to control exposure **Guidance** • HSE describe the objective of COSHH as “to prevent, or adequately control, exposure to substances hazardous to health so as to prevent ill health” • The principles from regulation 7(1) are described with associated guidance (p.30) • For control of biological agent exposure,

Assessment of evidence
Regulation 8 Use of control measures etc “(1) Every employer who provides any control measure, other thing or facility in accordance with these Regulations shall take all reasonable steps to ensure that it is properly used or applied as the case may be. (2) Every employee shall make full and proper use of any control measure, other thing or facility provided in accordance with these Regulations and, where relevant, shall – (a) take all reasonable steps to ensure it is returned after use to any accommodation provided for it; and (b) if he discovers a defect therein, report it forthwith to his employer.”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Special Waste Regulations 1996. 1996 [cited 11 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 as applicable to consignment notes in Scottish health and care settings (see above entry). As amended by the Special Waste Regulations (Scotland) 2004 (see below entry). In Regulation 1, the following definition is provided: ““consignor”, in relation to a consignment of special waste, means the person who causes that waste to be removed from the premises at which it is being held;” In the Explanatory Note, it is stated that “Regulation 2 defines special waste”.					

Assessment of evidence
In the Explanatory Note, it is stated that “Regulation 4 requires […] the Scottish Environment Protection Agency (in relation to Scotland) […] to give unique codes to be applied to consignments of waste or to a carrier’s rounds. […] The codes are to be shown, together with other required information, on consignment notes which are to accompany the waste when transported” Regulation 5 details the “standard procedure” for consignment notes. In the Explanatory Note, it is stated that “Regulation 15 implements Article 4.3 of the Directive on the keeping of records by those consigning and carrying hazardous waste. They are both required to keep the documents for three years”. In Regulation 15, it is stated that “At each site from which any consignment of special waste has been removed, the consignor shall keep a register containing— (a) a copy of the consignment note; and (b) where the consignment is one to which regulation 8 applies, a copy of that part of the carrier’s schedule retained under regulation 8(5),”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Environmental Protection Act 1990. 1990 [cited 12 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
Described in corresponding guidance (Scottish Government Code of Practice – see above entry) as relevant to waste transportation. “An Act to make provision for the improved control of pollution arising from certain industrial and other processes” Section 34 relating to Duty of Care states that: “it shall be the duty of any person who imports, produces, [F1018keeps or manages] controlled waste or, as a broker [F1019 or dealer], has control of such waste, to take all such measures applicable to him in that capacity as are reasonable in the circumstances”					

Assessment of evidence
“(a) to prevent any contravention by any other person of subsection (2A), (2E), (2F), (2I) or (2K);] (b) to prevent the escape of the waste from his control or that of any other person;” “(c) on the transfer of the waste, to secure— (i) that the transfer is only to an authorised person or to a person for authorised transport purposes; and (ii) that there is transferred such a written description of the waste as will enable other persons to avoid a contravention of that section [F1026or any condition of a permit granted under regulation 7 of those Regulations]and to comply with the duty under this subsection as respects the escape of waste.” This legislation is not specific to health and care settings, but Section 34 is specific to Scotland. SHTN waste guidance describes this legislation in relation to waste management in Scottish health and care settings (see below entry). See also the Scottish Government statutory guidance document on the Duty of Care (see above entry).

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Environmental Protection (Duty of Care) (Scotland) Regulations 2014 2014 [cited 12 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
Described in corresponding guidance (Scottish Government Code of Practice – see above entry) as relevant to waste transportation. In the Explanatory Note, it is stated that “Section 34(1) of the Environmental Protection Act 1990 (“the 1990 Act”) imposes a duty on any person who imports, produces, keeps or manages controlled waste, or who as broker or dealer has control of such waste, to take such measures on the transfer of the waste as are reasonable in the circumstances to secure that there is transferred with the waste such a					

Assessment of evidence
written description of the waste as will enable other persons to avoid a contravention of any duty under that section or under section 33 of the 1990 Act.” Regulation 3 states that “(1) The transferor and the transferee must ensure that a document as described in paragraphs (3) and (4) is completed in writing and signed by each of them in respect of the waste being transferred (“a transfer note”). (2) A transfer note must be prepared at the same time as the written description is transferred in accordance with section 34(1)(c) of the Act. (3) A transfer note must— (a) give the name and address (including the postcode) of the transferor and the transferee; (b) give the date and place (including the postcode) of the transfer; (c) state whether the transferor is the producer of the waste; (d) state whether the transferor is the importer of the waste; (e) describe the type, composition and quantity of the waste being transferred (including, where the waste is in a container, the type of container); (f) identify the waste being transferred by reference to the appropriate six-digit code in the European Waste Catalogue; and (g) identify the activity carried out by the transferor in respect of the waste being transferred by reference to the SIC code for that activity.” Regulation 4 states that “Regulation 3 does not apply where— (a) the waste transferred is special waste within the meaning of the Special Waste Regulations 1996(13); and (b) a consignment note (and if appropriate schedule) is completed and dealt with in accordance with those Regulations.” Regulation 5 states that “The transferor and the transferee must keep the written description and the transfer note (or copies of them) for a period of two years from the date of transfer of the waste.”

Assessment of evidence
Regulation 6 states that "(1) A competent authority may request any person required to keep a written description, or a transfer note under regulation 5, to produce the description or note (or a copy) to that authority. (2) The person must produce the description or note (or the copy) as soon as is reasonably practicable, and in any case— (a) within 7 days from the date of the request; or (b) such longer period as is permitted by that authority. (3) The description or note (or copy) must be— (a) given to an officer of that authority; or (b) sent to the address specified by that authority when making the request. (4) In this regulation, "competent authority" means— (a) the Scottish Environment Protection Agency; or (b) a waste collection authority for the purposes of Part 2 of the Act (14)." Regulation 7 states that "The Environmental Protection (Duty of Care) Regulations 1991(15) are revoked."

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Sehulster L, Chinn RY; CDC; HICPAC. Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC). MMWR Recomm Rep. 2003;52(RR-10):1-42.	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This CDC guidance makes a specific recommendation regarding transportation of medical waste in US health and care settings. This evidence table entry has been updated from previous update The aim of this document was to provide evidence-based environmental infection control guidance for prevention of “environmentally mediated infections, particularly among health-care workers and immunocompromised patients”. Studies included were outbreak studies (considering “environmental opportunistic microorganisms and epidemiological- or laboratory experimental studies”) and organisational standards and guidelines, supplemented by expert opinion where there was insufficient evidence. Although literature searches were carried out, there was not enough evidence to deduce that methods were systematic, so this guidance was graded as Level 4. Recommendations: Where waste cannot be treated where medical waste is generated, it should be transported in “impervious” containers to the treatment location (Category IC) Note – in the appendices the authors signpost to an external source on regulated medical wastes in the U.S, where it is stated that (regulated) medical waste is “healthcare waste that that may be contaminated by blood, body fluids or other potentially infectious materials”.

Question 11: How should waste be stored prior to uplift for disposal in health and care settings?

Evidence added to Literature Review V5.0

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Scottish Government. Duty of Care – A Code of Practice. 2012 [cited 25 August 2023]	Statutory guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This Scottish Government Code of Practice addresses waste storage requirements for waste producers in Scotland as per the Duty of Care (legislative requirement).

This statutory guidance document produced by the Scottish Government outlines duties for controlled waste producers, keepers, importers and/or managers in Scotland under Section 34 of the Environmental Protection Act 1990 (as amended). Published in 2012 but has regulatory requirements for 2014 onwards, in line with the implementation of The Environmental Protection (Duty of Care) (Scotland) Regulations 2014.

The authors explain that this document is intended to address waste management based on a person's role in the Duty of Care.

Waste producer obligations

A waste producer is "any person (with the exception of an occupier of domestic property in respect of waste produced on that property) who produces waste in the course of their activities", and the authors state that they have the most important role in waste management, as they are best suited to describe the waste accurately, and therefore its' safe management through the latter stages of the waste management process.

Assessment of evidence

In terms of preventing waste escape:

- “You must not allow waste to escape from your control and that of your employees, or the control of others during subsequent transportation.”
- As such, waste holders should “act to keep waste safe against: Spillages from corrosion or wear and tear of containers; accidental spilling or leaking or inadvertent leaching from waste unprotected from rainfall; accident or weather breaking contained waste open and allowing it to escape; waste blowing away or falling while stored or transported; scavenging of waste by vandals, thieves or animals.”

Improperly handled/stored waste has potential to cause environmental pollution, so those storing waste on their premises should ensure:

- Safe and secure storage in “suitable containers”. Skips or similar containers should have covers or nets and waste should be stored under cover if there’s potential for weather to alter its’ recycling potential or “cause contaminated run-off”. Waste containers should be kept in good condition
- Waste should be stored securely with limited access

To prevent waste causing harm or pollution through improper management, waste should not be allowed to escape the producer’s control, e.g. by leaking from containers, checking that a carrier subsequently handles it safely.

Obligations for waste collectors, waste managers (“operators of transfer stations, sorting facilities, treatment sites, incineration facilities and landfills”, waste import or export, broker or dealers and householders are described.

Limitations

- Not health and social care specific
- Large focus on recycling/repurposing – Zero Waste Plan
- Not focused on IPC or infectious waste

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health. Health Building Note 00-03: Clinical and clinical support spaces. 2013 [cited 28 August 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This HBN describes waste storage in dirty utility rooms in clinical support spaces, prior to be taken to the disposal hold.

Health Building Notes provide evidence-based best practice guidance for the design of healthcare buildings and facilities described on p.1 as “professional opinion of healthcare planning and design experts and ergonomic research (published and unpublished). This document focuses on “generic clinical and clinical support spaces for use in healthcare settings”, with generic rooms described as those being able to support a range of clinical activities.

The authors describe dirty utility rooms:

- The purpose of these rooms is for storage of waste sacks before they are taken to a disposal hold, but also for disposal of small volumes of liquid human waste and sometimes urinalysis
- Local waste management policy will determine the amount of space required for holding waste sacks
- Sacks should be taken to the appropriate disposal hold for collection once they have been filled and sealed to avoid clutter and odour
- These rooms should be located so that distance staff have to carry waste is minimal to reduce likelihood of spillage and cross contamination.

Assessment of evidence
This UK DoH guidance has been published by HFS on the NSS website and is exactly the same with an additional NHSScotland cover page.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health. Health Building Note 00-09: Infection control in the built environment 2013 [cited 28 August 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This HBN describes waste storage requirements for the built environment in the context of infection prevention and control. A specific recommendation is made regarding waste storage capacity. This Health Building Note aims to address IPC issues and risks to address during project design and construction. This guidance can be applied to all healthcare facilities, but does not extend to operational IPC management like outbreaks or standard precautions. It is intended to be cross referenced with the Health and Social Care Act 2008: Code of Practice Target audience: “all providers of NHS care”; “NHS Trust CEs, Care Trust CEs, Foundation Trust CEs, Medical Directors, Directors of PH, Directors of Nursing, Allied Health Professionals, Communications Leads, Emergency Care Leads” Disposal rooms are for temporary waste storage before cleaning, reprocessing or disposal, and these rooms should be appropriately sized depending on estimated amount and type of waste expected to be produced, and collection frequency.

Assessment of evidence
Clinical waste should be stored separately from cleaning equipment and laundry in “purpose-built areas to prevent cross-contamination”. Storage should have allow floor and shelf access for cleaning. Storage should be large enough for segregation of waste streams before uplift, separating domestic and clinical waste, and clinical waste by waste stream with no public access. Waste should be stored in secure storage areas near ward/department entrances (with access from ward and hospital corridors so that only authorised personnel are collecting the waste) rather than in dirty utility rooms. Waste should be disposed of separately from used linen to prevent contamination of linen and of linens being disposed of accidentally Waste storage should be easy to clean. The “holding area” should be spacious enough for a wheeled-bin. Designated secure storage is required for receptacles from the “whole site” before they are collected for disposal, which should be located away from publicly accessible areas, and also easy to clean and not accessible for animals Temporary holding bays that are external should be “washable, secure and animal-proof”, and only “rigid lockable receptacles” should be used for external storage Waste should not be left for long periods of time, with collection following a “strict routine” Waste storage size should reflect the number of waste streams it’s anticipated to hold and capacity should reflect frequency of collection Recommendations: • Waste storage should be large enough to store different types of waste streams

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England NHS Estates. HBN 26 Facilities for surgical procedures. 2004 [cited 29 August 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This HBN addresses requirements for waste storage in facilities where surgical procedures are carried out.

This Health Building Note provides guidance for facilities for surgical procedures in healthcare settings, based on a department containing eight operating theatres with their own aesthetic and preparation rooms and recovery unit.

Target audience: “project and design teams; estates directors and their staff; PFI consortia and private-sector contractors; executive directions and senior managers of acute trusts; Infection Control teams; clinicians from every profession working in operating departments, or in partnership with, surgical care teams; NHS Foundation Trusts”

Waste sacks and bags should not be stored in dirty utility rooms for operating theatres, but taken to the disposal hold when full.

As considerable waste is produced in an operating department, a disposal hold is necessary for holding “bagged refuse, clinical waste, soiled linen and materials for recycling” and “full “sharps” containers” before collection. This room should be lockable and accessible from a hospital street so that collections can be carried out without entering the clinical space. The size of the disposal hold should take into consideration the number of trolleys that will need to be stored in the space and collection frequency.

This UK DoH guidance has been published by HFS on the NSS website and is exactly the same with an additional NHSScotland cover page.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health. Health Building Note 07-02: Main renal unit. 2013 [cited 29 August 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Requirements for waste storage for main renal units are described in this HBN.

This Health Building Note presents guidance for the built environment of a renal unit.

Target audience is not described.

The authors state that contaminated waste produced in haemodialysis facilities and renal wards are a challenge, producing likely higher volumes of clinical and non-clinical waste than any other department.

There should be a dirty utility room for decontamination of equipment and for disposal of liquid and solid wastes. If there is not a disposal room, then this room should be big enough for storing waste for disposal. There should be ample space for storing trolleys, and should contain “pedal-operated sack-stands”. The floor should be “impervious”.

Disposal rooms are required for temporary storage for waste disposal, amongst other uses. The floor should be “impervious”, and should be set up to support clinical waste spill, but the details of this is not clear.

This UK DoH guidance has been published by HFS on the NSS website and is exactly the same with an additional NHSScotland cover page.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health. Health Building Note 04-01: Adult in-patient facilities. 2009 [cited 29 August 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This HBN makes reference to storing waste in a disposal hold in adult inpatient facilities, and temporary storage in dirty utility rooms.

This Health Building Note presents best practice guidance for the design of adult in-patient facilities.

Target audience is not described.

A supplement for infectious disease isolation facilities in acute care is provided, but not relevant to waste.

Waste for disposal should be kept in a disposal hold, but some items may be temporarily kept in a dirty utility room before being taken to a disposal hold.

Disposal holds are intended for temporary storage of waste (clinical and non-clinical). This guidance references HBN 00-03 for specifics.

This UK DoH guidance mostly aligns with the NHSScotland HFS version.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. In-patient care Scottish Health Planning Note 04-01: Adult in-patient facilities. 2010 [cited 12 January 2024]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This HBN makes reference to storing waste in a disposal hold in adult inpatient facilities, and temporary storage in dirty utility rooms.

“best practice guidance on the design and planning of new healthcare buildings and can also be used on the adaption/extension of existing facilities.” […] providing information “to support the briefing and design processes for individual projects in the NHSScotland building programme.” It is stated that this document was updated “using the core text provided by the Estates and Facilities Division of the Department of Health (DH), England.”

Aim: aims to clinical and operational design of adult in-patient facilities

Target audience: “broad”, clinical and operational staff

The following guidance is provided regarding waste storage:

- “Suitable space will be required for all the sack holders for the colour-coded disposal bags used for the bagging of waste materials and dirty linen skips. If clinical waste is stored here the room must be secured/lockable”

Assessment of evidence
• "The disposal hold provides the temporary storage point for all items of supplies and equipment that have to be removed for cleaning, reprocessing, disposal or destruction. Materials include clinical and non-clinical waste and also items to be transferred to the sterile services department." • "The disposal of waste and used items must be consistent with the current hospital policy for the disposal of clinical waste."

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Centers for Disease Control and Prevention. Procedures for Safe Handling and Management of Ebola-Associated Waste. 2022 [cited 08 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This CDC guidance addresses some requirements for storing packaged Ebola-associated waste. This CDC guidance aims to provide detailed protocols to be read in conjunction with the CDC guidance on "Ebola-Associated Waste Management". It is stated that this guidance is applicable to Ebola Disease and Marburg Virus Disease, and the page is currently being reviewed so the terminology used is true to this. Target audience: "Hospital infection control, occupational health systems, and facility medical waste managers and personnel"					

Assessment of evidence
Under “Secondary packaging and removal of waste”: “Safely transport to a designated and secure storage area that is preferably isolated and with limited access for approved waste vendor pickup.”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Safe management of wastes from health-care activities, 2nd ed. 2014 [cited 15 September]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
Specific recommendations are made in this WHO guidance regarding waste storage requirements, and further requirements for infectious waste storage are also made. Citations supporting these recommendations are not provided. This WHO guidance provides guidance on safe handling and disposal of waste from health care globally, also addressing waste management options for developing countries. This second addition of ‘The Blue Book’ updates guidance from 2007. This guidance comprises of expert opinion from “internal consultation and collaboration” at a conference in 2007, with peer-review of each chapter from experts worldwide. Names of those who contributed to the first edition are provided in appendix 1.					

Assessment of evidence
Target audience: “medical staff, health-care facility directors, ancillary health workers, infection-control officers and waste workers […] regulators, policy-makers, development organizations, voluntary groups, environmental bodies, environmental health practitioners, advisers, researchers and students” As a minimum, “Infectious waste, general waste and used sharps waste are stored in separate colour-coded containers and locations within medical areas, and subsequently at a central storage site at a health-care facility”, and waste receptacles and storage should be regularly cleaned. Waste storage that is closed may be required in or close to areas within a healthcare setting if waste collection is not frequent Hazardous and non-hazardous waste should be segregated when collected, transported and stored Hazardous waste should be stored in utility rooms designed for waste, dirty linen and cleaning equipment, known as interim or short-term storage. Otherwise, waste should be stored in a designated area close to the clinical area but not accessible to the public. Infectious waste storage should preferably be locked labelled clearly. Recommendations for waste storage include: • “impermeable, hard-standing floor with good drainage (away from watercourses)” which is easy to clean • Allow segregation of infectious and other hazardous waste • Water supply to allow cleaning • Easily access for staff involved in waste management/handling • A secure lock • Easy access for waste collection vehicles • Protection from direct sunlight • No access for animals, insects and birds (can act as vector) • Good lighting and some ventilation

Assessment of evidence
• Not located close to food stores/preparation • Cleaning supplies, PPE and waste receptacles close by • Washing facilities • Regular cleaning (at least weekly) • Spillage equipment • Appropriate size according to volume of waste generated Waste storage should be within the healthcare facility, with size calculated based on waste volume and collection frequency. Areas should be separate from food preparation and supply rooms and be secure. They should include “loading docks, space for compactors and balers for cardboard, staging areas for sharp boxes, recycling containers and secure storage (e.g. for batteries)” Storage labels should reflect hazard level of the waste being stored (see figures 7.8 and 7.9) The types of waste storage described include non-hazardous/general waste, hazardous waste, infectious and sharps waste, chemical and hazardous pharmaceutical waste and radioactive waste. The following guidance is provided for infectious waste storage: • This storage area should be labelled with a biohazard sign • Tiles or seals on walls and floors should allow easy disinfection • If there is a special waste sewage system then this storage space should be connected to this • “compacting of untreated infectious waste or waste with a high content of blood or other body fluids destined for offsite disposal (for which there is a risk of spilling) is not permitted” • Apart from sharps, infectious waste should be refrigerated at no more than 3 to 8 degrees C when being kept for more than a week

Assessment of evidence
• Where there is not refrigerated storage, waste should not be kept in temperate climates for more than 72 hours in winter and 48 hours in summer Guidelines for pharmaceutical, chemical and radioactive waste storage are also provided. Industrial boots and heavy-duty gloves are important when in waste storage areas in case of improper segregation or waste spills. Where sharps injury through weak barriers or improper segregation are likely, leg protectors may be considered. Chapter 14 addresses contingency planning for emergencies such as natural disasters and conflicts. It is not clear if the same approach would be required for pandemic response e.g. COVID-19 PPE storage. The following guidance is provided “Segregated waste should preferably be stored in specific restricted areas. The storage area should be a locked room or guarded enclosure. If this is not available, large containers with lids may be used for temporary storage of segregated waste and should be placed in restricted areas to minimize contact with people and animals. Mark the storage area with the biohazard symbol, or put a sign or mark that is understood locally to differentiate between hazardous and non-risk wastes.” **Limitations** • This guidance is from 2014 so some guidelines may be out of date

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health & Social Care. Infection prevention and control: resource for adult social care.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
2022 [cited 20 September 2023]					

Assessment of evidence

Although no specific recommendations are made, this UK guidance addresses waste storage in adult social care.

This guidance outlines IPC principles for preventing and managing infections in adult social care, where adult social care covers activities helping the elderly, those living with disabilities or physical/mental illness out-with NHS services, unpaid carers included. This guidance is based off information from NICE, NHS, government departments and other professional regulatory bodies, but Care Quality Commission providers should also comply with those regulations and Code of Practice.

Target audience: “those responsible for setting and maintaining standards of IPC within adult social care in England”

Design of care buildings where patients are expected to require accommodation should be designed so that there is sufficient space for waste storage.

All waste producers and those involved in waste management should know how to store waste for collection or disposal “according to hazard”.

Waste management protocol should be reviewed as part of outbreak response where large quantities of waste are expected to be produced, but specific contingency measures are not provided.

Limitation

- Please note that Appendix 1 contains links for “further information” including the NHS England IPC Manual. Since references are not provided, it is not clear if this was one of the documents which informed this guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. Health and safety in care homes 2014 [cited 21 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This HSE guidance addresses waste storage for hazardous waste in care homes. This HSE guidance is aimed at outlining care home risks and methods of managing these risks. This guidance is not mandatory but the authors advise that compliance should facilitate compliance with the law. Target audience: those “providing and managing care homes” and those working in social care. Hazardous waste containers should be stored “in an appropriate place” before uplift i.e. they should not be left in corridors or publicly accessible areas of the care home. Waste storage should be specifically for hazardous waste and be “enclosed and secure”. Hazardous waste should not be collected by municipal/domestic waste collectors.					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Infection prevention and control guideline for Ebola and Marburg disease 2023 [cited 10 November 2023]	Guideline	**AGREE II Recommend with Modifications**	N/A	N/A	N/A

Assessment of evidence

Maximum waste storage time is addressed in this guideline in the context of considerations for implementation of treating Ebola/Marburg-associated waste, so no citations are provided to support this statement.

Guideline “provides IPC recommendations for Ebola and Marburg disease outbreaks” with a healthcare focus and wider consideration of community settings. These recommendations should be followed during readiness or response activities. Core and development team members and affiliations are listed, including methodology experts. New evidence should result in updates (no timeline provided). Previous update recommendations have been incorporated alongside new evidence and a distinction made where appropriate. Intended audience: “policy-makers, health-care administrators and managers, IPC specialists, logisticians, community workers, burial teams and all health and care workers.”

Methods: a “guideline development group” made of diverse backgrounds and an “external peer-review group” were involved in the review and consultation process. GRADE was used to appraise appropriate evidence. Systematic reviews from previous updates were summarised and their recommendations incorporated where appropriate. This 2023 update involved a series of studies: systematic review, rapid reviews, scoping review and mixed methods study. The systematic review was used for an AGREE II appraisal and graded AGREE Recommend with Modifications, based on ARHAI criteria.

Assessment of evidence
In the context of the Good practice statement regarding treatment of Ebola/Marburg-associated waste, the following is stated regarding implementation considerations: “Ideally, waste should not be stored for longer than 24 hours before being destroyed.” **Limitations** • These are global recommendations and will be applicable to Scottish health and care settings if there were an outbreak of Ebola virus or Marburg disease. • Poor distinction between methodologies and findings of each development process different studies carried out. • Poor reporting of search strategies, time ranges and inclusion/exclusion criteria. • Poor description of populations likely influenced by the content of these guidelines. • No statement of influence of funding bodies. • Tools are yet to be published. • Timeline and methods for update are not provided.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Standards New Zealand. Management of Healthcare Waste 2002 [cited 22 September 2023]	Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence
Types of waste storage are defined and minimum requirements are described for storage design in this New Zealand standard. This New Zealand standard contains best practice guidance (beyond legislative requirements) on human and animal healthcare waste disposal including classification, segregation, packaging/containment, labelling, storage and transport, where healthcare waste refers to all waste produced by a healthcare facility. These standards aim to assist compliance with regulations and best practice in healthcare waste management. Pre-disposal storage is defined as waste storage of waste taken from holding areas before final disposal. Primary storage is the storage near the waste source. Storage is defined as “the accumulation of waste, after segregation, in a specified container in a specific location”. Hazardous waste should be refrigerated. Hazardous and controlled waste should be stored in “designated areas […] or by special arrangement with the waste transporter”. It will not be left unattended where the public may have access. Storage should be sufficient to allow segregation, refrigerated if required and measures should be in place to avoid “obnoxious odours or nuisance”. The following minimum requirements are provided: • Security i.e. away from supply and food preparation rooms, secure with restricted access • Design i.e. free from vermin and easily cleaned (“impervious material and floors bunded or graded to a valved sewer outlet”) • Access i.e. there should be enough space for personnel to access and move around • Lighting i.e. enough so that cleaning can be carried out and labels and documentation can be seen and read • Ventilation should be enough so that storage is free from odours, and exhaust vents should prevent exhausts from entering publicly accessible areas or the building

Assessment of evidence
• Signs should indicate waste categories • Cleaning materials PPE and hand washing facilities should be available to allow clean-up of spills and to maintain cleanliness. Emergency waste management plans should address non-compliance with refrigerated storage **Limitations** • From 2002 so may not be reflective of current best practice • How best practice determined not clear • Guidance for compliance with NZ legislation

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. Scottish Health Facilities Note 30 Part A: Manual. Information for Design Teams, Construction Teams, Estates & Facilities and Infection Prevention & Control Teams.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
2014 [cited 04 October 2023]					

Assessment of evidence

SHFN 30 provides guidance for waste storage in Scottish health and care settings.

Scottish Health Facilities Note 30 (SHFN 30) Part A is considered the 'manual' within a series covering IPC best practice considerations in the built environment. Part B covers implementation and assessment and Part C contains question sets and checklists. Compliance is to guide fulfilment of mandatory requirements as per the NIPCM. This version (4.0) is the most recent update. The 'waste management' section sits within '5. Typical rooms: purpose and content'. "Disclaimer The contents of this document are provided by way of general guidance only at the time of its publication. Any party making any use thereof or placing any reliance thereon shall do so only upon exercise of that party's own judgement as to the adequacy of the contents in the particular circumstances of its use and application."

- Signposts to 'Duty of Care – A Code of Practice' and SHTN waste guidance for storage of healthcare waste.
- "Dedicated secure storage areas for waste are best located at entrances to wards or departments, preferably with access from both ward and hospital corridor to facilitate collection by authorised personnel only."
- "Dedicated waste storage areas should be able to be cleaned easily and efficiently. The holding area should be of sufficient size to hold wheeled-bins and waste sacks ensuring that healthcare waste is clearly segregated from other wastes to avoid contamination."
- "The system and frequency of collection of waste service needs to be taken into account when planning facilities. Areas for temporary storage e.g. holding bays and/or intermediate rigid receptacles such as wheeled bins may be required. Temporary storage facilities should be washable, secure and animal-proof. Only rigid lockable receptacles should be stored in external areas."
- "Storage areas need to be fit for purpose and a suitable size to allow different waste types to be stored safely and separately. Collection frequencies including contingency requirements (in the event of a failure in waste collection) should be taken into consideration when specifying the size of storage areas. The design of the facility should also take account of accessibility and space needed for vehicles collecting the waste."

Assessment of evidence
Health Facilities Scotland is within National Services Scotland and this guidance applies to Scottish health and care settings.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England. Health Technical Memorandum 07-01: Safe and sustainable management of healthcare waste 2022 [cited 23 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
HTM 07-01 provides specific requirements for bulk waste storage in health and care settings. Guidance supporting compliance with waste legislation is also provided. Health technical memoranda are described as “comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology” for healthcare delivery. This guidance targets safe and sustainable management of healthcare waste for all NHS Trusts, and laboratories and vet surgeries. it is stated that this best practice guidance is not mandatory unless stated. Where authors have used this wording is indicated in the ETs by “”s. The authors provide the following guidance on these choices of wording: • “must” for legal compliance • “should” for a recommendation that is not mandatory

Assessment of evidence

- “may” for permission

This guidance replaces the 2013 version, with the aim of supporting compliance with legislative changes and better capturing sustainability goals including the NHS Clinical Waste Strategy.

A list of contributors is provided, and a statement thanking those from the “scoping and technical engagement phases” indicating a consultation phase but not much detail is provided on how this guidance was formed, including no indication of systematic methods.

Target audience: those involved in NHS waste management (details on relevant sections by job role are signposted in Table 1, p.4), targeted towards compliance with English legislation and regulations so should not be “relied upon” by devolved nations.

Table 10 lists bulk storage requirements:

- “Individual bags and containers (for example, bins and boxes) of waste must not be stored loosely. Bagged waste should be stored and handled in fully enclosed, lockable, rigid, leak-proof and weatherproof containers.
- Rigid waste containers (bins and boxes) must be sealed and in good condition. They should be stored and handled in an upright position to minimise the risk of spillages.
- Containers must have a lid which is securely closed whenever they contain any waste, except when waste is being loaded into or unloaded from them.
- Anatomical waste and animal carcasses must be stored in designated refrigerated units (operating below 5°C) unless stored on site for less than 24 hours.
- Infectious wastes that are not pharmaceutical, chemical, anatomical or palletised wastes must be stored in a secure building.
- These infectious wastes may be stored outside at facilities that were operating before this guidance was published, but only if all of these conditions are met:
    - it is not technically or economically feasible to store them in a building
    - alternative storage arrangements provide an equivalent level of environmental protection to storage in a building

Assessment of evidence
○ an appropriate site-specific environmental risk assessment is carried out which includes (but is not limited to) an assessment of emissions to land and water (including odour), pests and flood risk the waste is in containers that remain closed and locked at all times, except when waste is being loaded or unloaded from them ○ the containers are stored in a secure area of the site that has impermeable surfacing and sealed drainage. • Store and handle offensive wastes in a secure building or in secure, fully enclosed, rigid, waterproof and leak-proof containers. • If waste is stored externally in containers (such as 770l bins), the containers must remain closed at all times, except when waste is being loaded or unloaded from them. • Do not store or hold wastes on site in vehicles or vehicle trailers, unless they are being received or prepared for imminent transfer (that is, they will be removed from site within 24 hours, or 72 hours if over a weekend) or unless as agreed in response to an emergency or business continuity scenario (see paragraphs 6.143–6.158). • Always maintain the integrity of waste packaging in a way that minimises handling. Never throw, walk on or handle healthcare wastes in a way that might damage the packaging. Pay particular attention to items at or near the bottom of containers, and avoid overloading, compressing or puncturing waste” For primary care, waste bags and sharps containers “should” follow packing and storage requirements described in previous chapters. Waste producers, importers, keepers, storers, transporters and those treating and disposing of waste “must take all reasonable steps to ensure that waste is managed properly from the point of production to the point of final disposal”. The authors signpost to a COVID-19 waste management SOP for NHS England as an example of contingency planning - Coronavirus » COVID-19 waste management standard operating procedure (england.nhs.uk) **Limitations** • The Welsh HTM 07-01 is based off of the old 2013 HTM 07-01. However, this current version is also linked out in NHS Wales web pages, so it is not clear if Welsh NHS boards are also to follow this guidance. • Unclear methodology and inconsistent in text citations used.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland Waste Management Guidance: Scottish Health Technical Note 03-01. Version 7.0. 2023 [updated 09 December 2024; cited 02 November 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

SHTN 03-01 details requirements for bulk storage in Scottish health and care settings, and requirements for practice to support compliance with legislation.

This guidance aims to help boards in NHSScotland meet waste management legal, policy, procedural requirements and best practice in Scotland, applicable to NHSScotland healthcare services producing waste, superseding the SHTN 03-01 Parts A to D. It is stated that NHSScotland staff and contractors should not rely on the HTM 07-01 or UK-wide waste management guidance alone due to differing legal requirements across the UK.

Target audience: “staff and contractors involved at all stages of waste management in the modern healthcare setting”

Written by the NHSScotland Waste Management Steering Group. Member names and job titles are not provided.

Endorsed by SEPA.

A disclaimer is provided stating that the guidance is “general” and accurate at time of publication.

Assessment of evidence

Training and audit requirements are also described in chapters 14 and 15 respectively but are out-with the remit of this review.

Specific" waste stream segregation:

- Category A infectious waste should not be left for 24 hours. It should be stored "securely" with limited access ("authorised trained personnel" only)

Waste collection:

- "With regard to infectious waste, excluding sharps, the collection period should be no less than once a week, unless the waste is refrigerated"
- "Healthcare waste should be stored securely. Failure to do so is a breach of the duty of care. This applies to storage at the point of production as well as intermediate and bulk storage areas"

Waste receptacles should not be left in "corridors, wards or other places accessible to unauthorised personnel or members of the public", and "should be stored securely so as to prevent the escape of waste, prevent harm to the environment and/or human health" under the duty of care statutory requirements. This requirement applies to storing waste at point of production, intermediate and bulk storage.

At point of production ("ward level"), waste storage should be "secure and located away from public areas". Storage should be big enough "to allow packaged waste to be segregated and to avoid waste of different classifications being stored together in the same area."

Bulk storage (applying to healthcare facilities and also transfer or treatment facilities) should be:

- "reserved for specific waste streams only
- well-lit and ventilated
- sited away from food preparation and general storage areas and from routes used by the public
- totally enclosed and secure
- provided with separate storage for each waste stream
- of sufficient size to ensure sharps receptacles and waste medicines, which may need a higher degree of security, are kept in a safe area in order to prevent unauthorised access

Assessment of evidence
• sited on a well-drained, impervious hard standing • readily accessible to authorised people • kept locked when not in use • secure from entry by animals and free from insect or rodent infestations • provided with wash-down facilities and spillage equipment • provided with washing facilities for employees • clearly marked with warning signs • provided with separate, clearly labelled areas for waste that requires, rather than is destined for, different treatment/ disposal options • provided with access to first-aid facilities • appropriately drained, that is, to a sewer (with discharge consent)” Storage capacity should be influenced by waste collection frequency. “Refrigerated storage will be required in hot weather if the waste poses a statutory nuisance due to odour. If refrigeration is required, refrigerated storage units must be fitted with a device for opening from inside as a precaution against people being trapped.” A waste management license or permit may be required for bulk storage (“even at the site of production”. More information on this is provided in chapter 10. “Basic personal hygiene is important in reducing the risk from handling healthcare waste. Employers need to ensure that washing facilities are conveniently located for people handling healthcare waste and this is particularly important at storage and incineration facilities”

Evidence from previous update(s)

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Environmental Protection Act 1990. 1990 [cited 12 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
Described in corresponding guidance (Scottish Government Code of Practice – see above entry) as relevant to waste storage. “An Act to make provision for the improved control of pollution arising from certain industrial and other processes” Section 34 relating to Duty of Care states that: “it shall be the duty of any person who imports, produces, [F1018keeps or manages] controlled waste or, as a broker [F1019or dealer] , has control of such waste, to take all such measures applicable to him in that capacity as are reasonable in the circumstances” “(a) to prevent any contravention by any other person of subsection (2A), (2E), (2F), (2I) or (2K);] (b) to prevent the escape of the waste from his control or that of any other person;” “(c) on the transfer of the waste, to secure— (i) that the transfer is only to an authorised person or to a person for authorised transport purposes; and (ii) that there is transferred such a written description of the waste as will enable other persons to avoid a contravention of that section [F1026or any condition of a permit granted under regulation 7 of those Regulations]and to comply with the duty under this subsection as respects the escape of waste.” This legislation is not specific to health and care settings, but Section 34 is specific to Scotland. SHTN 03-01 waste guidance describes this legislation in relation to waste management in Scottish health and care settings (see above entry). See also the Scottish Government statutory guidance document on the Duty of Care (see above entry).					

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Environmental Protection (Duty of Care) (Scotland) Regulations 2014. 2014 [cited 12 September 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence

Described in corresponding guidance (Scottish Government Code of Practice – see above entry) as relevant to waste storage.

In the Explanatory Note, it is stated that “Section 34(1) of the Environmental Protection Act 1990 (“the 1990 Act”) imposes a duty on any person who imports, produces, keeps or manages controlled waste, or who as broker or dealer has control of such waste, to take such measures on the transfer of the waste as are reasonable in the circumstances to secure that there is transferred with the waste such a written description of the waste as will enable other persons to avoid a contravention of any duty under that section or under section 33 of the 1990 Act.”

Applicability of this legislation in health and social care settings is described in the SHTN 03-01 waste management guidance (see above entry) and the Scottish Government Duty of Care guidelines (see above entry).

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health and Health Protection Agency. Prevention and control of infection in care homes – an information resource. 2013 [cited 03 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

Specific requirements for waste storage are provided in this UK care homes guidance.

Best practice infection prevention and control guidance for staff caring for residents in care homes in England and should be read in conjunction with "The Health and Social Care Act 2008: Code of Practice on the prevention and control of infections and related guidance". The authors state that not all of the guidance will be applicable to all care homes.

Target audience: "Care Trust CEs, GPs, Communications Leads, Consultants in Communicable Disease Control, Community Infection Control Nurses, Health Protection Nurses, Care Home Managers, Care Quality Commission"

Under Part 3 that addresses "Basic infection prevention and control practices" i.e. Protocols that should be applied by all care workers at all times to reduce likelihood of infection:

- Waste management guidance provided aims to facilitate adherence with English legislation (Hazardous Waste (England and Wales) Regulations 2005, as amended by the Hazardous Waste (England and Wales) Amendment Regulations 2009, and the Lists of Waste Regulations 2005 "(which introduce the European Waste Catalogue Codes)"), under which any infectious or hazardous waste is classed as hazardous

Assessment of evidence
• "The person in charge" is responsible for management of clinical and hazardous waste i.e. ensuring correct classification, containment, labelling/tagging and secure storage before final treatment • There should be dedicated "stillages" for waste storage which are well-drained, "with impervious hard standing and wash-down facilities". Storage should be secure and should not be accessible by those who are not authorised nor scavenging animals". To avoid cross-contamination, clinical and hazardous waste should remain segregated in storage from general waste and soiled laundry. **Limitations** • For waste management, the bibliography references the DoH Safe management of healthcare waste guidance which is now archived.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Sehulster L, Chinn RY; CDC; HICPAC. Guidelines for environmental infection control in health-care facilities. Recommendations of CDC and the Healthcare Infection Control Practices Advisory Committee (HICPAC).	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
MMWR Recomm Rep. 2003;52(RR-10):1-42.					

Assessment of evidence

This CDC guidance provides a specific recommendation regarding waste storage requirements, and describes further requirements within the summary of evidence with no in text citations provided.

The aim of this document was to provide evidence-based environmental infection control guidance for prevention of “environmentally mediated infections, particularly among health-care workers and immunocompromised patients”.

Studies included were outbreak studies (considering “environmental opportunistic microorganisms and epidemiological- or laboratory experimental studies”) and organisational standards and guidelines, supplemented by expert opinion where there was insufficient evidence.

Although literature searches were carried out, there was not enough evidence to deduce that methods were systematic, so this guidance was graded as Level 4.

Recommendations:

Regulated wastes waiting to be treated, should be stored in ventilated areas not accessible to vertebrate pests in waste containers designed to prevent noxious odours developing (Category IC)

Within the summary of evidence on managing regulated medical waste, it is also stated that:

- “Health-care facilities are instructed to dispose medical wastes regularly to avoid accumulation. Medical wastes requiring storage should be kept in labeled, leakproof, puncture-resistant containers under conditions that minimize or prevent foul odors. The storage area should be well ventilated and be inaccessible to pests. Any facility that generates regulated medical wastes should have a regulated medical waste management plan to ensure health and environmental safety as per federal, state, and local regulations.”, with no references provided, suggesting that this point may be based on expert opinion

Assessment of evidence
Note – in the appendices the authors signpost to an external source on regulated medical wastes in the U.S, where it is stated that (regulated) medical waste is “healthcare waste that that may be contaminated by blood, body fluids or other potentially infectious materials”

Question 12: How should waste spillages be managed?

Evidence added to Literature Review V5.0

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
World Health Organization. Safe management of wastes from health-care activities, 2nd ed. 2014 [cited 15 September];	Guidance	**Level 4**	N/A	N/A	N/A
Assessment of evidence					
This WHO guidance addresses how waste spills should be managed in health and care settings, and items which may be useful to include in a spill kit. This WHO guidance provides guidance on safe handling and disposal of waste from health care globally, also addressing waste management options for developing countries. This second addition of ‘The Blue Book’ updates guidance from 2007.					

Assessment of evidence

This guidance comprises of expert opinion from “internal consultation and collaboration” at a conference in 2007, with peer-review of each chapter from experts worldwide. Names of those who contributed to the first edition are provided in appendix 1.

Target audience: “medical staff, health-care facility directors, ancillary health workers, infection-control officers and waste workers […] regulators, policy-makers, development organizations, voluntary groups, environmental bodies, environmental health practitioners, advisers, researchers and students”

The authors recommend a “written spill contingency plan”

Hazardous spills should be dealt with by “designated personnel specially trained for the purpose”

For waste spillages, the area will need to be decontaminated. It is important to establish the infectious agent when highly infectious materials have been spilled in case the area needs to be evacuated, but the most hazardous waste spills tend to happen in laboratories.

Box 11.2 provides an example of procedures for dealing with spills:

- “Evacuate the contaminated area.
- Decontaminate the eyes and skin of exposed personnel immediately.
- Inform the designated person (usually the waste-management officer or infection-control officer), who should coordinate the necessary actions.
- Determine the nature of the spill.
- Evacuate all the people not involved in cleaning up if the spillage involves a particularly hazardous substance.
- Provide first aid and medical care to injured individuals.
- Secure the area to prevent exposure of additional individuals.
- Provide adequate protective clothing to personnel involved in cleaning up.
- Limit the spread of the spill.

Assessment of evidence

- Neutralize or disinfect the spilled or contaminated material, if indicated.
- Collect all spilled and contaminated material. (Sharps should never be picked up by hand; brushes and pans or other suitable tools should be used.) Spilled material and disposable contaminated items used for cleaning should be placed in the appropriate waste bags or containers.
- Decontaminate or disinfect the area, wiping up with absorbent cloth. The cloth (or other absorbent material) should never be turned during this process, because this will spread the contamination. The decontamination should be carried out by working from the least to the most contaminated part, with a change of cloth at each stage. Dry cloths should be used in the case of liquid spillage; for spillages of solids, cloth impregnated with water (acidic, basic or neutral, as appropriate) should be used.
- Rinse the area, and wipe dry with absorbent cloth.
- Decontaminate or disinfect any tools that were used.
- Remove protective clothing and decontaminate or disinfect it, if necessary.
- Seek medical attention if exposure to hazardous material has occurred during the operation.
- Report the incident and document the response."

Box 11.2 references the book "Infectious and Medical Waste Management" by Reinhardt and Gordon (1991) which has since been re-published (2017).

Table 11.3 describes items required for collecting and re-disposing of the waste:

- "protective equipment" for securing the area – it's not clear what equipment this is referring to
- Absorbent material for containing the spill
- Disinfectant e.g. bleaching powder (dilution depending on nature of spillage) should be used for neutralising and disinfecting spills of infectious material
- Absorbent material will be needed to collect liquids, and a broom/forceps/dustpan or shovel for collecting solids

Assessment of evidence
• Either a plastic bag (appropriately colour coded) or a sharps container will be required for containing the spill • Disinfectants will be required for decontaminating the area • The spill should then be reported Decontamination will also be required immediately if the hazardous substances come into contact with the skin or eye. **Limitations** • This guidance is from 2014 so some guidelines may be out of date

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health and Safety Executive. Health and safety in care homes. 2014 [cited 21 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This HSE guidance for care homes lists items which are useful to include in waste spill kits. This HSE guidance is aimed at outlining care home risks and methods of managing these risks. This guidance is not mandatory but the authors advise that compliance should facilitate compliance with the law. Target audience: those “providing and managing care homes” and those working in social care. Those who handle and transport hazardous waste should be sufficiently trained and on how to handle spillages and “other incidents”.

Assessment of evidence
The authors recommend spill kits which should consist of single-use PPE (aprons and gloves), clinical waste bags and tags, paper towels, sodium hypochlorite and instructions on how to use these items.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Standards New Zealand. Management of Healthcare Waste. 2002 [cited 22 September 2023]	Standard	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This New Zealand standard describes spill kits for managing waste spills in health and care settings and items which should be included in these. This New Zealand standard contains best practice guidance (beyond legislative requirements) on human and animal healthcare waste disposal including classification, segregation, packaging/containment, labelling, storage and transport, where healthcare waste refers to all waste produced by a healthcare facility. These standards aim to assist compliance with regulations and best practice in healthcare waste management. Spill kits should be available to contain and clean spillages and decontaminate the affected area. These kits should be available to “generators, transport vehicles and treatment/disposal premises”. Spill kits should consist of “absorbents, disinfectants, buckets, a shovel, gloves, disposable overalls, facemask/shield, disposable containers and plastic bags with appropriate labelling”

Assessment of evidence
Limitations • From 2002 so may not be reflective of current best practice • How best practice determined not clear • Guidance for compliance with NZ legislation

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Government of Canada. Infection prevention and control measures for Ebola disease in acute care settings. 2023 [cited 07 September 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence
This Canadian guidance describes a recommended procedure for managing waste spills containing Ebola-associated waste. Aim: “guidance on the minimum level of IPC measures in healthcare settings in the event that a person under investigation for EBOD or patient with EVOD is identified within a Canadian healthcare facility” Appendix C in this Governmental guidance covers management of waste associated with suspected and confirmed cases of Ebola. Guidance is relevant to “facility and medical” waste management personnel, IPC, occupational health and safety and HCW educators and “environmental services personnel” who may manage Ebola-associated waste in Canada. Evidence used for development is stated as

Assessment of evidence
“currently available scientific evidence, standards and regulations” with consideration of gaps or inconclusive research where appropriate. This guidance should be updated in line with emerging evidence. This document does not include care and management of the deceased. Section: ‘Recommended management of on-site spills related to EBOD-associated blood and other body fluids’ • “Spills containing EBOD-associated human waste (i.e., blood, emesis, urine, feces and dialysate/effluent) should be managed by trained HCWs (i.e., nurses, doctors) caring for the patient, and wearing appropriate PPE, including enhanced PPE based on a risk assessment, along with following guidance for safe removal of PPE, according to the organization's policy. • 'Spill kits' should be made available, according to organization's policy, for use in designated assessment/care rooms/areas. • The spill area should be isolated from access to other individuals until cleaning and disinfection is completed. • All major spill incidents should be documented, according to organization's policy.” **Limitations** • A dedicated reference list for Appendix C is not provided and in-text citations are not used so it is unclear how evidence informed above guidance. • Reference list mainly contains guidance and other grey literature specific to Canadian healthcare settings, so the guidance did not consider primary literature. • This guidance presents minimum infection prevention and control measures for acute Canadian healthcare facilities. The authors state that these guidelines were developed based on Canadian settings so applicability to Scottish settings may be limited. • Much of the references are CDC and WHO but in text citations are not used so it is not clear where CDC/WHO citations has contribute to this guidance

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
NHS England. Health Technical Memorandum 07-01: Safe and sustainable management of healthcare waste 2022 [cited 23 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

HTM 07-01 considers managing waste spills in the context of applicable health and safety procedures.

Health technical memoranda are described as “comprehensive advice and guidance on the design, installation and operation of specialised building and engineering technology” for healthcare delivery. This guidance targets safe and sustainable management of healthcare waste for all NHS Trusts, and laboratories and vet surgeries.

it is stated that this best practice guidance is not mandatory unless stated. Where authors have used this wording is indicated in the ETs by “”s. The authors provide the following guidance on these choices of wording:

- “must” for legal compliance
- “should” for a recommendation that is not mandatory
- “may” for permission

This guidance replaces the 2013 version, with the aim of supporting compliance with legislative changes and better capturing sustainability goals including the NHS Clinical Waste Strategy.

Assessment of evidence
A list of contributors is provided, and a statement thanking those from the “scoping and technical engagement phases” indicating a consultation phase but not much detail is provided on how this guidance was formed, including no indication of systematic methods. Target audience: those involved in NHS waste management (details on relevant sections by job role are signposted in Table 1, p.4), targeted towards compliance with English legislation and regulations so should not be “relied upon” by devolved nations. To comply with English legislation, the following guidance is provided for handling clinical waste: • Spills should only be managed if health and safety procedures are followed – the authors signpost to the SICPs chapter of the NHS England NIPCM **Limitations** • The Welsh HTM 07-01 is based off of the old 2013 HTM 07-01. However, this current version is also linked out in NHS Wales web pages, so it is not clear if Welsh NHS boards are also to follow this guidance. • Unclear methodology and inconsistent in text citations used.

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Health Facilities Scotland. NHSScotland Waste Management Guidance: Scottish Health Technical Note 03-01. Version 7.0.	Guidance	**Level 4**	N/A	N/A	N/A

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
2023 [updated 09 December 2024; cited 02 November 2023]					

Assessment of evidence

SHTN 03-01 addresses best practice for managing waste spills in health and care settings, including examples of items to include in spill kits. Relevant legislation which should be adhered to in Scottish settings is also signposted.

This guidance aims to help boards in NHSScotland meet waste management legal, policy, procedural requirements and best practice in Scotland, applicable to NHSScotland healthcare services producing waste, superseding the SHTN 03-01 Parts A to D. It is stated that NHSScotland staff and contractors should not rely on the HTM 07-01 or UK-wide waste management guidance alone due to differing legal requirements across the UK.

Target audience: “staff and contractors involved at all stages of waste management in the modern healthcare setting”

Written by the NHSScotland Waste Management Steering Group. Member names and job titles are not provided.

Endorsed by SEPA.

A disclaimer is provided stating that the guidance is “general” and accurate at time of publication.

Training and audit requirements are also described in chapters 14 and 15 respectively but are out-with the remit of this review.

There should be written procedures for spill management throughout the waste management process.

Incidents of spills, damaged packages, “inappropriate” segregation or needlestick accidents should be investigated.

Spill management procedures should include the procedure for reporting and investigating the incident, “safe system of work” to clean up the spill, decontamination requirements and required protective clothing.

Spill kits should be readily available e.g. in storage, transportation vehicles and waste treatment and disposal sites.

Assessment of evidence
An example of contents is provided: • “disposable gloves • a disposable apron • an infectious waste sack/ medicinal waste receptacle • paper towels • disposable cloths • disinfectant recommended, for example, by the local control of infection policy • a means of safely collecting sharps” Additional requirements include: • “Employers need to provide appropriate equipment for collecting spilled waste and placing it in new receptacles. • Sharps must not be picked up by hand. • Spilled waste and any absorbent materials need to be placed in an infectious waste receptacle for disposal” • policy should also describe disinfectant, level of dilution and contact time. Accidents and incidents should be reported under the following: • Social security (Claims and Payments) Regulations 1979 • CEL 43 (2009) • RIDDOR 2013

Assessment of evidence
PPE required should be determined by employers' risk assessment which also addresses spills. "This might include the need for protective equipment to prevent exposure via routes such as skin contact (for example, disposable aprons and gloves) or inhalation/ ingestion (for example, respiratory protection and/ or face visors)."

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Control of Substances Hazardous to Health Regulations 2002 2002 [cited 24 August 2023]	Legislation	**Mandatory**	N/A	N/A	N/A

Assessment of evidence
This legislation is signposted in SHTN 03-01 as applicable to managing waste spills in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that "These Regulations re-enact, with modifications, the Control of Substances Hazardous to Health Regulations 1999 (S.I. 1999/437) ("the 1999 Regulations"). The 1999 Regulations imposed duties on employers to protect employees and other persons who may be exposed to substances hazardous to health and also imposed certain duties on employees concerning their own protection from such exposure, and prohibited the import into the United Kingdom of certain substances and articles from outside the European Economic Area." 3. "Where it is not reasonably practicable to prevent exposure to a substance hazardous to health, the employer shall comply with his duty of control under paragraph (1) by applying protection measures appropriate to the activity and consistent with the risk assessment, including, in order of priority - . (d) The design and use of appropriate work processes, systems and engineering controls and the provision and use of suitable work equipment and materials;

Assessment of evidence
(e) the control of exposure at source, including adequate ventilation systems and appropriate organisational measures; and (f) where adequate control of exposure cannot be achieved by other means, the provision of suitable personal protective equipment in addition to the measures required by sub-paragraphs (a) and (b).”

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
Scottish Government. CEL 43 (2009) Safety of Health, Social Care, Estates and Facilities Equipment: NHS Board and Local Authority Responsibilities. 2009 [cited 14 December 2023]	Chief Executive Letter	**Mandatory**	N/A	N/A	N/A

Assessment of evidence
This legislation is signposted in SHTN 03-01 as applicable to managing waste spills in Scottish health and care settings (see above entry). “This CEL builds on and strengthens existing arrangements in relation to the above and sets out the responsibilities of Chief Executives for ensuring that procedures exist for the reporting of adverse incidents, the dissemination of safety advice and the control of risks relating to health, social care, estates and facilities equipment.”

Assessment of evidence
“Adverse incident reports should be sent to HFS, contact details in Annex B. Reports should also be copied to the local Equipment Co-ordinator.“

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013. 2013 [cited 14 December 2023]	Legislation	**Mandatory**	N/A	N/A	N/A
Assessment of evidence					
This legislation is signposted in SHTN 03-01 as applicable to managing waste spills in Scottish health and care settings (see above entry). In the Explanatory Note, it is stated that these regulations “maintain requirements that the responsible person must notify, and subsequently send a report to, the relevant enforcing authority by an approved means in relation to fatal and certain non-fatal work-related accidents, specified diseases contracted by persons at work and certain specified dangerous occurrences.”					

Evidence from previous update(s):

Study	Study Type	Evidence Level	Intervention	Comparison	Outcome measure
UK Department of Health and Health Protection Agency. Prevention and control of infection in care homes – an information resource. 2013 [cited 03 October 2023]	Guidance	**Level 4**	N/A	N/A	N/A

Assessment of evidence

This UK care homes guidance references the timeliness of addressing waste spills.

Best practice infection prevention and control guidance for staff caring for residents in care homes in England and should be read in conjunction with "The Health and Social Care Act 2008: Code of Practice on the prevention and control of infections and related guidance". The authors state that not all of the guidance will be applicable to all care homes.

Target audience: "Care Trust CEs, GPs, Communications Leads, Consultants in Communicable Disease Control, Community Infection Control Nurses, Health Protection Nurses, Care Home Managers, Care Quality Commission"

Under Part 3 that addresses "Basic infection prevention and control practices" i.e. Protocols that should be applied by all care workers at all times to reduce likelihood of infection:

- Spillages in waste storage should be "cleaned up immediately".

Assessment of evidence
Limitations • For waste management, the bibliography references the DoH Safe management of healthcare waste guidance which is now archived