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# WHTM 01-04

Welsh Health Technical Memorandum

## Decontamination of linen for health and social care

Management  
and provision

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## Welsh Health Technical Memorandum 01-04: Decontamination of linen for health and social care. Management and provision

### Overview

### Introduction

This WHTM supersedes HSG(95)18 *Hospital laundry arrangements for used and infected linen*.

This change realigns it with WHTM 01-05:2014 *Decontamination in primary care dental practices and community dental services* and the naming convention used for other healthcare estates and facilities related technical guidance documents within Wales. It will also help to address the recommendation to align decontamination guidance across the four nations.

### Purpose

The purpose of this WHTM is to provide guidance regarding the management, use and decontamination of healthcare and social care linen. The guidance is designed to ensure patient safety and enhanced outcomes are at the forefront of decision making.

The WHTM decontamination suite is listed below:

- WHTM 01-01: Management and decontamination of surgical instruments (medical devices) used in acute care
- WHTM 01-04: Decontamination of linen for health and social care
- WHTM 01-05: Decontamination in primary care dental practices
- WHTM 01-06: Decontamination of flexible endoscopes

### Who should use the WHTM 01-04 series

This guidance will be of direct interest to providers of care and those working in laundry management and linen decontamination. Management and technical information is also provided for care providers and linen services providers.

### Definition of linen

For the purposes of this document, “linen” means all reusable textile items requiring cleaning/disinfection via laundry processing including:

- Bed linen: blankets, counterpanes, cot sheets and blankets, duvets, duvet covers, pillowcases and sheets (woven, knitted, half sheets, draw and slide sheets);
- bibs;
- blankets;
- canvases;
- curtains;

- hoist slings;
- patient clothing (gowns, nightdresses and shirts, pyjama tops and bottoms);
- staff clothing (coats, scrub suits, tabards, uniforms);
- towels.

## Status

If any laundry installation or premises includes facilities for the sterilisation of medical devices, then the Requirements of WHTM 01-01 Part A:2013 will also apply to the steriliser installation. Other existing regulations and industry standards are discussed in the 'Engineering, equipment and validation' volume of this WHTM

## Structure

WHTM 01-04 is divided into four volumes. The 'Management and provision' volume includes:

- a description of the overall structure of the guidance and the rationale behind the structure;
- Welsh Government and related UK policy on safe linen decontamination and processing.

The 'Social care' volume gives guidance on how to implement linen decontamination in social care settings.

The 'Guidance for linen processors implementing BS EN 14065' volume gives guidance on ways of complying with WHTM 01-04 specifically for those organisations that have implemented, or will be implementing, the European standard BS EN 14065:2016.

The 'Engineering, equipment and validation' volume covers:

- the standards and regulatory framework;
- roles of key personnel;
- the built environment;
- design and pre-purchase considerations; and
- validation and verification of disinfection performance of washers, washer-extractors and continuous tunnel washers (CTWs).

Each volume contains disinfection-specific information only.

## Acknowledgements

This guidance is based on HTM 01-04:2016 *Decontamination of linen for health and social care: management and provision* published by the Department of Health in 2016. NHS Wales Shared Services Partnership – Specialist Estates Services is grateful to the Department of Health for its permission to adapt the original guidance for application in Wales.

The contents of the original document were reviewed by NHS Wales Shared Services Partnership – Specialist Estates Services, decontamination representatives from NHS Wales and Welsh Government.

## Abbreviations

**ACDP:** Advisory Committee on Dangerous Pathogens

**BP:** Best practice

**BSI:** British Standards Institution

**CEN:** European Committee for Standardization (comité européen de normalization)

**Cfu:** Colony forming units

**CTW:** Continuous tunnel washer

**DIPC:** Director of Infection Prevention and Control

**EQR:** Essential Quality Requirements

**GCL:** Guild of Cleaners & Launderers

**HIW:** Health Inspectorate Wales

**HSE:** Health and Safety Executive

**IQ:** Installation qualification

**MDD:** Medical Devices Directive

**OJEU:** Official Journal of the European Union

**OQ:** Operational qualification

**PPE:** Personal protective equipment

**PQ:** Performance qualification

**RABC:** Risk analysis and biocontamination control

**SHLSLM:** Society of Hospital Linen Services & Laundry Managers

**TSA:** Textile Services Association

**TVC:** Total viable count

**UKAS:** United Kingdom Accreditation Service

**W/E:** Washer-extractor

**WEL:** Workplace exposure limits

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## Chapter 1

# Policy

## Guidance summary

- 1.1 This policy and guidance is designed to help healthcare professionals to procure and deliver the standard of decontamination that our patients have a right to expect, by building on existing good practice.
- 1.2 In accordance with the Welsh strategy *Commitment to purpose: eliminating preventable healthcare associated infections (HCAIs)* (Welsh Government 2011) and the *Code of practice for the prevention and control of healthcare associated infections* (Welsh Government 2014). Welsh NHS Organisations should assure themselves that services are meeting expected requirements. This complements the rights for patients under the *National Health Service (Wales) Act 2006*, WHC (2015)015 *Health and Care Standards and Fundamentals of Care* (Welsh Assembly Government 2003).
- 1.3 Patients have a right to expect care. This includes the range of support services such as the provision of a linen and laundry service that reduces the risk of cross-infection and enhances the patient experience.
- 1.4 Laundry and its products should preserve the patient's dignity, promote the patient's care, and be appropriate to the patient group, gender, clinical status, religion and beliefs. Where appropriate, it should support the use of personal clothing.
- 1.5 Laundry to be provided and used by care providers should be fit for purpose. It:
  - should look visibly clean;
  - should be the right material;
  - should not be damaged or discoloured.
- 1.6 If used in clinical areas where surgical procedures are performed, it should have the required amount of impermeability from body fluids (containment), inhibit shedding of fibers at the surgical site and in some cases be sterile and offer a degree of personal protection.

## Introduction

- 1.7 This WHTM provides guidance for all those processing linen used in health and adult social care. This will primarily be laundries, launderette operators and local linen processors (hereafter referred to as "linen processors").
- 1.8 The guidance provided in this WHTM is aimed at establishing the highest possible standard, in linen processing performance at all levels.



**Note**

The *All Wales NHS dress code: free to lead, free to care* (Welsh Assembly Government 2010) and *Uniforms and workwear: an evidence base for developing local policy* (DH 2007) should be taken into consideration when formulating local policy for the implementation of this WHTM and applying it to uniform laundering.

## Code of practice for the prevention and control of healthcare associated infections (Welsh Government 2014)

- 1.9 The guidance provided here follows the essential principles given in Code of practice for the prevention and control of healthcare associated infections (Welsh Government 2014). This requires that effective prevention and control of infection be embedded in everyday practice. For this reason, the guidance is written with emphasis on practical and readily-implemented measures.
- 1.10 Every healthcare linen processor should be capable of meeting the following standards and communicate these local provisions to the providers of care such that they may be agreed and incorporated into local policy:
- There is a duty of care to carry out a hazard and risk assessment and to reduce risk to an acceptable level. As part of this, laundry staff should not undertake the pre-sorting of infectious linen.
  - Regardless of the technology used, linen should be processed using a disinfection cycle complying with the requirements of **paragraphs 5.45 - 5.61** 'Disinfection of linen', thereby achieving at least the defined level of reduction in microorganism contamination.
  - Facilities for processing linen should be clearly separate from clinical treatment and publicly accessible areas. A separate facility/room or rooms should be used for the accommodation of linen processing. In these facilities, the room(s) should be used for this purpose only, and access should accordingly be restricted to those staff processing linen.
  - All healthcare linen processors should validate their disinfection processes as part of their BS EN 14065:2016 procedures or using the frequencies and methodologies outlined in the 'Engineering, equipment and validation' volume of this WHTM.
  - Linen processors who process infectious linen should undertake a risk analysis of their processes including identifying key areas requiring microbiological control and measuring key factors (critical control points) essential to a safe product. **Paragraph 5.70**, 'Risk analysis and biocontamination control' provides further explanation.
  - Linen processors should put in place the management structure defined in **Chapter 4**, 'Functional responsibilities', or follow the guidance given in the 'Social care' and 'Guidance for linen processors implementing BS EN 14065' volumes of this WHTM, as appropriate to their organisational needs.



- Linen processors should ensure safe systems of work are in place such as to offer protection to staff against exposure to infectious linen received from health and social care facilities to a level that is as low as reasonably practicable (see the Control of Substances Hazardous to Health (COSHH) Regulations).
  - Healthcare linen processors should have in place written policies and procedures for the safe operation of all equipment.
  - The environment in which linen processing is carried out should be such as to minimise the risk of recontamination of decontaminated linen and by doing so ensure the protection of patients, residents and staff involved in the handling of linen.
  - Processed linen should be transported and stored in such a way as to avoid microbiological recontamination as far as is reasonably practicable.
  - Storage areas for linen should be dedicated for the purpose and in accordance with [paragraph 5.74](#), 'Separation of process to prevent recontamination'.
  - Healthcare linen processors should have in place a detailed plan on how the provision and processing of such linen will achieve the standards set out within this WHTM.
- 1.11 The clauses above should reflect the local policies of the providers served. Mechanisms should be agreed between the parties to allow providers to assure themselves that linen processors have met the requirements of any agreed local policy.
- 1.12 For those that have not yet achieved independently certified biocontamination control systems in accordance with BS EN 14065:2016, the soiled linen area should be functionally separated from the clean-linen processing areas. Functionally separated is defined in the section on [paragraph 5.74](#).
- Linen processors who process infectious linen should adopt post-wash sorting of linen (for example, after processing through the washing equipment) for production purposes or limit pre-wash sorting to choice of machine type only. (Note that this refers to production/batch sorting and not necessarily to the adoption of option 2 detailed in [paragraph 5.27](#).)
  - Linen processors who process infectious linen should adopt bag handling and opening procedures that:
    - o do not use liquid permeable bags;
    - o minimise manual handling/ opening of infectious linen and



- any other exposure of staff to the linen prior to decontamination:
    - o are fully automated for washer loading (once technology has been developed to allow this); and
    - o are capable of being adequately disinfected.
- 1.13 It is envisaged, at this time, that easy-emptying impermeable bags combined with step conveyor-type systems could be implemented which may, if installed and operated correctly, achieve this option as an alternative to using water-soluble bags in CTWs.
- 1.14 Process design should be such as to reasonably ensure that laundry staff:
- o do not manually open bags containing infectious linen; and
  - o are protected from infectious agents.
- 1.15 Any systems adopted should not expose the laundry staff to any greater risk than that posed by the use of water-soluble bags.
- 1.16 The microbiological performance of the chemical disinfection process is evaluated using the additional dose strip test described in ‘Microbiological test for disinfection stage’ in the ‘Engineering, equipment and validation’ volume.

**Note**

For the purposes of this guidance, the following terminology is used:

Impermeable bags are bags that a liquid does not leak or pass through at any time during their use or during the washing process.

Liquid permeable bags are bags that a liquid may leak or pass through at any time. These are not to be confused with water-soluble bags (and bags with water-soluble seams), which only become permeable when processed in a washing machine. The traditional linen-style laundry bags often fall into this category.

Water-soluble bags (sometimes referred to as “alginate” bags) are (1) bags that dissolve or break apart when processed in a washing machine and/or (2) impermeable bags with a water-soluble seam. Throughout this volume, both types are referred to as “water-soluble bags”.



**Note**

Suppliers of linen decontamination services to the health and social care sector that have achieved independently certified adoption of BS EN 14065:2016 may consider this satisfy the aspirations of the Welsh Government.

## Training and education

- 1.17 Training and education in the processes of pathogen control, disinfection and hygiene (including hand hygiene), exposure to blood-borne viruses, health and safety, and infection risk reduction (including waste disposal) should be part of staff induction programmes, in accordance with Skills for Health: UK Core Skills Training Framework (<http://www.skillsforhealth.org.uk>) and should be recorded in staff training records. These are key aspects of safety and service quality.
- 1.18 Further advice on specific healthcare linen services education can be obtained from the Society of Hospital Linen Service and Laundry Managers (<http://www.linenmanager.co.uk>).

## Chapter 2

## Regulatory framework

### Summary

This chapter outlines the statutory requirements placed on those operating processes or plant that process health and social care linen. It identifies statutory reporting systems that apply to employers in order to satisfy regulatory health and safety requirements.

### Statutory requirements

#### Control of Substances Hazardous to Health (COSHH) Regulations 2002 (as amended)

- 2.1 The Health and Safety Executive (HSE) publishes guidance notes on current exposure limits in: *Workplace exposure limits* (2011a).
- 2.2 Users of laundry equipment should note that “substances hazardous to health” can include microorganisms that create a hazard to the health of any person.
- 2.3 Guidance on the precautions to be taken when handling microorganisms in a laboratory can be found in the following documents published by HSE and compiled with the Advisory Committee on Dangerous Pathogens (ACDP):
  - *Management, design and operation of microbiological containment laboratories* (HSE 2001);
  - *Biological agents: managing the risks in the laboratory and healthcare premises* (ACDP 2005a);
  - *Approved list of biological agents* (HSE 2013a); and
  - *Safe working and the prevention of infection in clinical laboratories and similar facilities* (HSE 2003) (compiled by the Health Services Advisory Committee).
- 2.4 They may be of use in determining principles for applying to handling of microbiological hazards in the laundry.

#### Personal Protective Equipment at Work Regulations 1992 (as amended)

- 2.5 Managers should assess whether the risks associated with laundry activities require the use of personal protective equipment (PPE). Some examples include overalls and aprons for use when loading washer-extractors, and protective gloves for use when sorting (further guidance is given at [paragraph 5.76](#), ‘Protection of laundry staff’).

#### Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (known as the Carriage Regulations)

- 2.6 Advice on the carriage of dangerous goods and the appointment of dangerous goods safety advisers (DGSAs) can be found in WHTM 07-01:2013 *Safe management of healthcare waste*

### **Application of the Carriage Regulations to used linen**

2.7 Most of the used linen that is transported to off-site laundries will not normally be assessed as dangerous for transport. Occasionally, infectious linen will need to be classified in this way, such as when a consignment is thought to contain pathogens that pose a significant risk of spreading disease and the load is heavily soiled to the extent that the potential for exposure and infection is high. In such instances, the load should be categorised as infectious, bagged accordingly and packaged as UN 3291. It is not appropriate for processing in a laundry (see also WHTM 07-01:2013 *Safe management of healthcare waste*).

### **The Consumer Protection Act 1987**

#### *Consumer Protection Act 1987 (Part 1)*

2.8 This legislation imposes strict liability on producers for harm caused by defective products. This means that people who are injured by defective products can sue for compensation without having to prove the producer negligent, provided that they can prove that the product was defective and the defect in the product caused the injury. The legislation applies to all consumer products and products used at a place of work.

#### *Consumer Protection Act 1987 (Part 2)*

2.9 Section 11 empowers the Secretary of State to make emergency regulations without consultation to secure the safety of products when public protection is deemed necessary. Regulations made under this procedure lapse after 12 months. However, under normal circumstances, the Act requires prior consultation with interested parties. Safety regulations made under the procedure remain in force indefinitely, unless specifically revoked.

2.10 Section 12 makes it an offence to supply goods that do not meet safety regulations made under the Act.

2.11 All consumer goods and goods used in the workplace are covered by the Act. A person can sue under the Act for compensation for death, personal injury and damage to private property (provided the amount of loss or damage to property is £275 or more). Medical devices legislation (under review) within the UK is enabled under the *Consumer Protection Act 1987*.

### **Statutory reporting procedure (RIDDOR)**

2.12 *The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013* place responsibilities on employers to report certain incidents and dangerous occurrences to the local office of the HSE. The action to be taken following any incident should be detailed in the organisation's procedures to ensure compliance with this legal requirement.

2.13 The User (see [paragraph 4.7](#), 'Roles and responsibilities') should notify HSE immediately, either online at: [www.hse.gov.uk/riddor](http://www.hse.gov.uk/riddor) , or by telephone for the following:

- a. any fatal injuries to employees or other people in an accident connected with the operation of the equipment;

- b. any major injuries specified in RIDDOR to employees, or other people, in an accident connected with the operation of the equipment;
  - c. any of the dangerous occurrences listed in the Regulations.
- 2.14 The User should send a written report to HSE of any incident including:
- a. any of the specific injuries listed in RIDDOR;
  - c. any other injury to an employee that results in their absence from work or being unable to do their normal work for more than seven days;
  - d. any of the cases of reportable occupational diseases listed in the Regulations.
- 2.15 A record should be kept of any injury, occurrence or case of disease requiring a report. This should include the date, time and place, personal details of those involved and a brief description of the nature of the event.
- 2.16 Examples of dangerous occurrences applicable to laundry equipment include:
- the explosion, collapse or bursting of any closed vessel;
  - electrical short-circuit or overload causing fire or explosion;
  - any explosion or fire resulting in the suspension of normal work for more than 24 hours;
  - an uncontrolled or accidental release or escape of any pathogens or substance from any apparatus or equipment;
  - any incident where breathing apparatus malfunctions in such a way as to deprive the wearer of oxygen.
- 2.17 Examples of reportable diseases applicable to laundry equipment include any illness caused by a pathogen.
- 2.18 Further details can be found in *Reporting accidents and incidents at work* (HSE 2013b).
- 2.19 Incidents and dangerous occurrences that are reported to HSE should also be reported to the Welsh Government, as appropriate, by telephone during the first working day after the incident and then followed by a written report.

## Climate change

2.20 The Intergovernmental Panel on Climate Change highlights three major issues:

- that warming in the climate system is unequivocal;
- that the effect of humans on the climate is clear; and
- that climate change mitigation requires significant reduction of greenhouse gas emissions.

2.21 This poses a double challenge for healthcare facilities:

- to reduce their carbon emissions and contribute to the national and NHS targets for climate mitigation, to identify opportunities for adapting to expected climate change and to build resilience to extreme climate events;
- to support resilient communities including planning services for expected changes in health needs and providing high quality healthcare particularly focusing on needs during adverse climatic conditions.

2.22 HTM 07-02 Parts A & B:2015 *EnCO<sub>2</sub>de - making energy work in healthcare* sets the foundations for meeting this challenge and for assisting in the delivery of a resilient healthcare estate as detailed in HBN 00-07:2006 *Planning for a resilient healthcare estate*. It is the primary guidance on energy efficiency in healthcare facilities in Wales. It has been produced as a guide to all issues relating to the procurement and management of energy in the NHS and energy efficiency in new build and existing buildings.

### **Finance Act 2000/Climate Change Agreements (Eligible Facilities) Regulations 2012**

2.23 Under the above legislation, industrial sectors that are high users of energy may be eligible for relief from the Climate Change Levy on energy by contracting with government to meet rigorously negotiated and audited energy reduction targets. The TSA administers a successful umbrella agreement on behalf of the industrial laundry sector. Reductions in water and chemical usage also accrue from technologies which save energy so the environmental impact of industrial laundering is further reduced.

2.24 Further information for NHS organisations with regard to the Climate Change Levy and the Carbon Reduction Commitment (CRC) Energy Efficiency Scheme are provided in HTM 07-02: 2015 *EnCO<sub>2</sub>de*.



## Chapter 3

# Standards, quality systems and other guidance

## Summary

This WHTM advocates a framework of European quality standards for adoption by linen processors. Standards and relevant other guidance that may apply are described in this section.

**BS EN 14065:2016 provides an outline of a suitable system that may be adopted by linen processors, and its implementation and external verification is encouraged by the Welsh Government.**

**Health boards /Trusts should consider that laundry services for health and social care that have achieved independently certified adoption of BS EN 14065:2016 have satisfied the aspirations of the Welsh Government.**

**Under the *Health and Safety at Work etc. Act 1974*, healthcare organisations have a duty of care to ensure that no risk is posed to staff in the laundering of linen.**

**Health boards / Trusts should enforce the duty of care so as to protect the environment and reduce the negative impacts of waste on people's quality of life.**

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- 3.1 Compliance with the following European standards described within this section would assist laundries processing and disinfecting healthcare products to demonstrate that they are committed to producing goods of an appropriate quality.

## BS EN 14065:2016. Textiles. Laundry processed textiles. Biocontamination control system

- 3.2 This standard describes a system compatible with ISO 9000:2015 for ensuring microbiological quality of linen used in sectors such as healthcare where it is necessary to control biocontamination. It is based upon a Risk Analysis and Biocontamination Control (RABC) system similar to that used within BS EN ISO 14698:2003.
- 3.3 It sets out requirements for auditable and documented process validation and monitoring procedures that could contribute to the microbiological quality of the processed textiles.



## BS EN ISO 9000. Quality management systems. Fundamentals and vocabulary

3.4 For those not processing medical devices, this standard provides a basis for an accredited quality system.

### Relevant other guidance

3.5 The following documents offer useful guidance in addition to this WHTM although they are not necessarily endorsed by the Welsh Government:

- *Accreditation standards for processing reusable textiles for use in healthcare facilities* (HLAC 2016);
- Best practice guide for linen services - published by the Society of Hospital Linen Services and Laundry Managers and available to members;
- *Laundry handbook and Code of practice for the safe operation of continuous tunnel washers* – both published by the Textile Service Association and available to members.

3.6 Further advice and support on healthcare engineering issues can be found on the NWSSP-SES website [www.wales.nhs.uk/ses](http://www.wales.nhs.uk/ses).

## Chapter 4

# Functional responsibilities

## Summary

**Training for all staff involved in the decontamination of linen for health and social care is essential. Guidance is given on appropriate staff training and the need to keep up to date with new developments with accompanying records.**

**Also covered is the need for all staff involved to have clearly defined roles and responsibilities, which are documented.**

**The role of the User is discussed as they have the responsibility to enact guidance contained in this WHTM.**

**The responsibilities of the executive manager (for example the hospital chief executive) are discussed, as they are responsible for operation of the laundry or purchased service. This responsibility should be delegated to key personnel who are listed together with other specialists whose assistance will be required on a regular basis.**

## Introduction

- 4.1 There have been profound changes in the management philosophy of both the NHS and adult social care provision. It is therefore not appropriate to prescribe a management structure that is universally applicable given the wide range of circumstances in which laundry equipment might be used – that is, from a large off-site centralised laundry to a small local unit with one washing machine.
- 4.2 Any locally agreed choice in management structure may wish to reflect the principles of this WHTM.

### Note

For the assignment of these roles in (a) laundries certified to BS EN 14065:2016 and (b) social care settings, the guidance given in the 'Social care' and 'Guidance for linen processors implementing BS EN 14065' volumes of this WHTM should be followed.

- 4.3 The approach taken by this guidance is to identify the distinct functions and the responsibilities that go with them. The titles given are therefore generic; they describe the individual's role, but are not intended to be prescriptive job titles for terms of employment. Indeed, many of the personnel referred to might not be resident staff but employed by outside bodies and those working on contract. Furthermore, in a small setting, many of the roles might be performed by a single person with additional support.

- 4.4 WHTM 00:2014 *Policies and principles of healthcare engineering* provides general advice – for the NHS sector – on these responsibilities along with the experience, qualifications and training required. However, that advice is based on a universal application in complex systems, which are probably inappropriate to many linen processors.
- 4.5 Linen processors can, therefore, establish their own choice of system concerning staff responsibilities, but they should be able to demonstrate the same degree of understanding, competency and management as required by WHTM 00:2014 *Policies and principles of healthcare engineering*. The following ‘Roles and responsibilities’ section can be used as a guide to these roles. The terminology used in this manual is used for clarity but it is likely that local personnel may have differing titles.
- 4.6 Further advice on the engineering roles is detailed in the ‘Engineering, equipment and validation’ volume of this WHTM.

## Roles and responsibilities

### Note

For the assignment of these roles in (a) laundries certified to BS EN 14065:2016 and (b) social care settings, the guidance given in the ‘Social care’ and ‘Guidance for linen processors implementing BS EN 14065’ volumes of this WHTM should be followed.

- 4.7 This section describes the roles and responsibilities of key personnel involved in the operation and use of decontamination processes in laundries.
- 4.8 Local choice may dictate that some staff will have other responsibilities unconnected with decontamination in laundries, and in some cases the same individual may take on more than one role.
- 4.9 In every case, however, it is possible to identify a User (see below) who is responsible for the day-to-day management of decontamination processes (including equipment) in laundries. The philosophy of this guidance is to invest the User with the responsibility for ensuring that the equipment is operated safely and efficiently.

### Note

Other volumes in the WHTM series recommend the use of an Authorised Person (Decontamination) and Authorising Engineer (Decontamination). Currently, their involvement is not widespread within the laundry sector. However, healthcare organisations that wish to implement these roles within this setting should consult WHTM 01-01 Part A:2013 for further guidance. It should however be noted that linen decontamination does not currently form part of the syllabus of training for Authorised Persons (Decontamination) and Authorising Engineers (Decontamination). NWSSP-SES can offer advice in this area.

NWSSP-SES Authorising Engineers (Decontamination) will also be able to provide independent sign-off and audit of validation results, if required.

### **Management – definition**

4.10 Management is defined as the owner, occupier, employer, general manager, chief executive or other person of similar authority who is ultimately accountable for the safe operation of the premises. In some cases this might be the laundry manager or care home manager.

### **Key personnel**

4.11 In this WHTM, the following are key personnel who have specific responsibilities within decontamination in laundries:

- Executive Manager (for example, chief executive);
- NHS/Organisation Decontamination Lead (this person may also act as the Designated Person if locally agreed);
- Designated Person;
- User (for example, a linen services manager or a laundry manager);
- Infection Prevention and Control Lead
- Infection Control Practitioner;
- Microbiologist (Decontamination);
- Operator.

4.12 Roles discussed in the ‘Engineering, equipment and validation’ volume are:

- Senior Operational Manager;
- Maintenance Engineer;
- Manufacturer;
- Contractor;
- Purchaser;
- Competent Person (Pressure Systems).



### **Executive Manager**

- 4.13 The Executive Manager is defined as the person with ultimate management responsibility, including allocation of resources and the appointment of personnel, for the organisation in which the laundry equipment is installed.
- 4.14 Depending on the nature of the organisation, this role may be filled by the general manager, laundry manager, chief executive, care home manager or other person of similar authority.

### **NHS/Organisation Decontamination Lead**

- 4.15 Every health and adult social care organisation should have a nominated Decontamination Lead with responsibility for decontamination. Further guidance is given in the Code and WHTM 01-01 Part A:2013.
- 4.16 The Decontamination Lead may also act as the Designated Person.

### **Designated Person**

- 4.17 This role is the interface between the linen processor and support services supplied internally or externally, including service, maintenance and testing. This could be the maintenance manager of the laundry or a care home manager. The Decontamination Lead could also act as the Designated Person.

### **User**

- 4.18 The User is defined as the person designated by management to be responsible for the management of the process. The User is also responsible for the Operators as defined below.
- 4.19 In the acute sector, the User could be a linen services manager. Alternatively, in primary or social care, this person could be a general practitioner, home manager or other health professional.
- 4.20 The principal responsibilities of the User, within local policy, are as follows:
- a. to certify that the laundry equipment is fit for use from a decontamination perspective;
  - b. to hold all documentation relating to the laundry equipment, including the names of other key personnel;
  - c. to ensure that laundry equipment from a decontamination perspective is subject to periodic testing and maintenance;
  - d. to appoint operators where required and ensure that they are adequately trained;
  - e. to maintain production records;
  - f. to establish procedures for product release in line with the quality management system;

- g. to ensure that procedures for production, quality control and safe working are documented and adhered to in the light of statutory requirements and accepted best practice.

**Note**

The User may seek the advice of infection control teams, which may consist of an Infection Prevention and Control Lead, Infection Control Practitioner or Microbiologist (Decontamination).

For larger linen processors (not primary care or care home settings), the Executive Manager should consider appointing a User with appropriate qualifications, for example:

- evidence of attendance on an approved course in laundry technology;
- a minimum of two years' experience in the management and provision of linen services;
- membership of an appropriate professional body with experience in the subject of laundry management (SHLSLM, TSA, Guild of Cleaners & Launderers (GCL) etc).

**NHS Infection Prevention and Control Leads**

- 4.21 An Infection Prevention and Control Executive Lead should be designated in each organisation. The Executive Lead reports directly to the chief executive and the Board and not through any other officer. The senior infection prevention control nurse oversees local infection control policies and their implementation. The Infection Control Doctor will fulfil the role of the Microbiologist (Decontamination).

**Infection Control Practitioner**

- 4.22 This person is designated by Management to be responsible for advising the User on all infection prevention and control aspects (see also the 'Social care' and 'Guidance for linen processors implementing BS EN 14065' volumes of this WHTM).

**Microbiologist (Decontamination)**

- 4.23 The Microbiologist (Decontamination) is defined as a person designated by Management to be responsible for advising the User on the microbiological aspects of the disinfection and recontamination of linen.
- 4.24 The Microbiologist (Decontamination) should have a relevant degree (for example microbiology or medicine).
- 4.25 The principal responsibilities of the Microbiologist (Decontamination) are:
- a. to advise the User on the microbiological aspects of decontamination procedures for linen;
  - b. to audit the documentation from all decontamination equipment that has been tested by microbiological methods.



4.25 In some organisations, the Microbiologist (Decontamination) and Infection Control Practitioner may be the same person.

**Operator**

4.26 The Operator is defined as any person with the authority to operate a washer-extractor, CTW and any other laundry equipment, including the noting of instrument readings and simple housekeeping duties.



## Chapter 5

# Decontamination arrangements for linen used in health and adult social care sectors

## Summary

This chapter details the way in which used linen should be sorted and classified. It discusses disinfection methods and sets a benchmark for chemo-thermal or chemical processes. Transport and storage arrangements are also discussed including bag colour coding and labelling. Importantly it describes the Welsh Governments' approach to laundry processes and their effectiveness against *Clostridium difficile*.

Health boards / Trusts should assure themselves that adequate sorting and disinfection arrangements are in place and that these arrangements are agreed between both linen processors and users. Health boards / Trusts should review how such arrangements are documented and look to satisfy themselves that the organisation is dealing with the risks associated to both staff and patients regarding infectious linen.

## Introduction

- 5.1 The microbiological quality required of textiles should be determined by their intended use. In certain cases where very high microbiological quality is required (for example in operating theatres), processing may need to be completed by sterilisation.
- 5.2 For general healthcare and care-home linen, the prime task of linen processing is to kill or remove microbial contamination derived from the previous user. Once the linen is decontaminated, recontamination with microbes from used linen should be avoided.
- 5.3 As a minimum, all linen processors who process infectious linen should undertake a risk analysis of their processes including:
  - identifying areas requiring microbiological control; and
  - setting and measuring critical control points as defined in [paragraph 5.70](#), 'Risk analysis and biocontamination control'.
- 5.4 Those processing large amounts of linen may should develop a plan to implement BS EN 14065:2016.
- 5.5 Health and adult social care providers should give consideration to the correct use, selection and validation of any local laundering arrangements such that the requirements of the above paragraph and the Code (Welsh Government 2014) can be met.
- 5.6 When selecting and operating locally installed equipment, the advice of the infection control team should be sought. A risk-based approach should be adopted.

- 5.7 Commercial, purpose-designed solutions are preferable to domestic solutions. Some physiotherapy departments and neonatal care units install domestic-type washing machines for local processing. Before any such similar areas are designed and installed, a full options appraisal and risk evaluation should be undertaken to demonstrate why existing centralised options (such as the use of the organisation’s main provider of linen processing services) are not suitable.

## Classification of linen

### History

- 5.8 The publication of Health Service Guideline *Hospital laundry arrangements for used and infected linen* (commonly known as HSG(95)18) in 1995 recommended the classification of linen into two groups: “used (soiled and fouled)” and “infected”.
- 5.9 At the time the HSG was written, limitations in the design of CTWs (called batch washers within the HSG) meant that restrictions were placed on high throughput machines that processed infectious linen (because of the risks associated with staff entering the machine to deal with breakdowns and maintenance, and the requirement to sort and handle linen before it was processed). This further encouraged the principle of linen classification.

### Approach to classification sorting and processing

- 5.10 CTWs and procedures have advanced over the last few years. This has opened the possibility of processing all types of work through these machines with the right control measures in place. With current trends in laundry development, this flexibility may improve further.
- 5.11 This WHTM recommends a risk-based approach to classification and allows the service-user and provider to agree the most suitable methods of, and procedures for, classification and sorting.
- 5.12 The advantages of increased throughput achieved by using CTWs for all linen classifications are difficult to ignore. These benefits should be evaluated by service-users and providers when agreeing the operating mode of any service. However, consideration should also be given to the maintenance, repair, health and safety, and environmental implications of such a decision. This will mean undertaking a full risk assessment of the options.

### Linen classifications

- 5.13 The following definitions apply specifically to the healthcare setting. Further guidance on applying definitions and classifications to the social care setting are discussed in WHTM 01-04 ‘Social care’.

*Used (soiled and fouled) linen*

- 5.14 This definition applies to all used linen, irrespective of state, but on occasions contaminated by body fluids or blood. It does not apply to:
- linen from infectious patients;
  - those suspected of being infectious; and
  - other linen covered by the following paragraph on “infectious linen”.

*Infectious linen*

- 5.15 This definition applies to:
- linen from patients with diarrhoea;
  - linen contaminated with blood or body fluids from patients with blood-borne viruses;
  - other conditions as specified by local policy (for example, varicella zoster and measles).
- 5.16 To ensure that only infectious linen is classified as such, service-users need to use the classification system correctly and accurately. (Some linen processors use a dedicated process for infectious linen, which could be overwhelmed by misclassification, leading to delays in the return of linen.)
- 5.17 Linen from patients infected with, or at high risk of having, hazard group 4 organisms (haemorrhagic fever viruses such as Lassa Fever) should not be returned to a laundry. See the Advisory Committee on Dangerous Pathogens (ACDP 2005b) guidance.

*Heat-labile items*

- 5.18 This category includes fabrics damaged by the normal heat disinfection process and those likely to be damaged at thermal disinfection temperatures. These fabrics should be washed at the highest temperature possible for the item; disinfection may be achieved by chemical disinfection, if required. Service-users should agree local policies regarding purchase of heat-labile items in accordance with available methods of disinfection and linen processing.

*Items contaminated with radiation*

- 5.19 For any items that are, or have been, contaminated with radiation (such as items contaminated with vomit following ingestion of radioactive iodine), the disposal guidance given in WHTM 07-01:2013 *Safe management of healthcare waste* should be followed.

### **Classification and sorting options**

5.20 Sorting fabrics into different drying types is an essential economic part of linen processing. Sheets, for example, require far less energy to dry them than would towels. In some linen processes/facilities, progression from the washing to the drying phases is automatic; therefore, fabrics have to be sorted before washing (“pre-wash sorting”). Some processes will allow sorting between washing and drying (“post-wash sorting”). All washer-extractor processes allow pre- or post-wash sorting.

5.21 This WHTM considers two differing scenarios on which any classification and sorting agreement can be based.

#### *Option 1: Infectious linen is segregated by the service-users*

5.22 Categorisation of linen should be done at local level with the appropriate colour-coded bags.

5.23 Infectious linen in this category should not be sorted, but should be sealed in a water-soluble\* bag, which should then be placed in an impermeable bag immediately on removal from the bed or before leaving a clinical department.

5.24 Water-soluble bags are also recommended for heavily fouled linen if capable of being processed by the washer and if agreed with the linen processor.

5.25 Soiled and fouled linen should be placed in an impermeable bag immediately on removal from the bed or before leaving a clinical department.

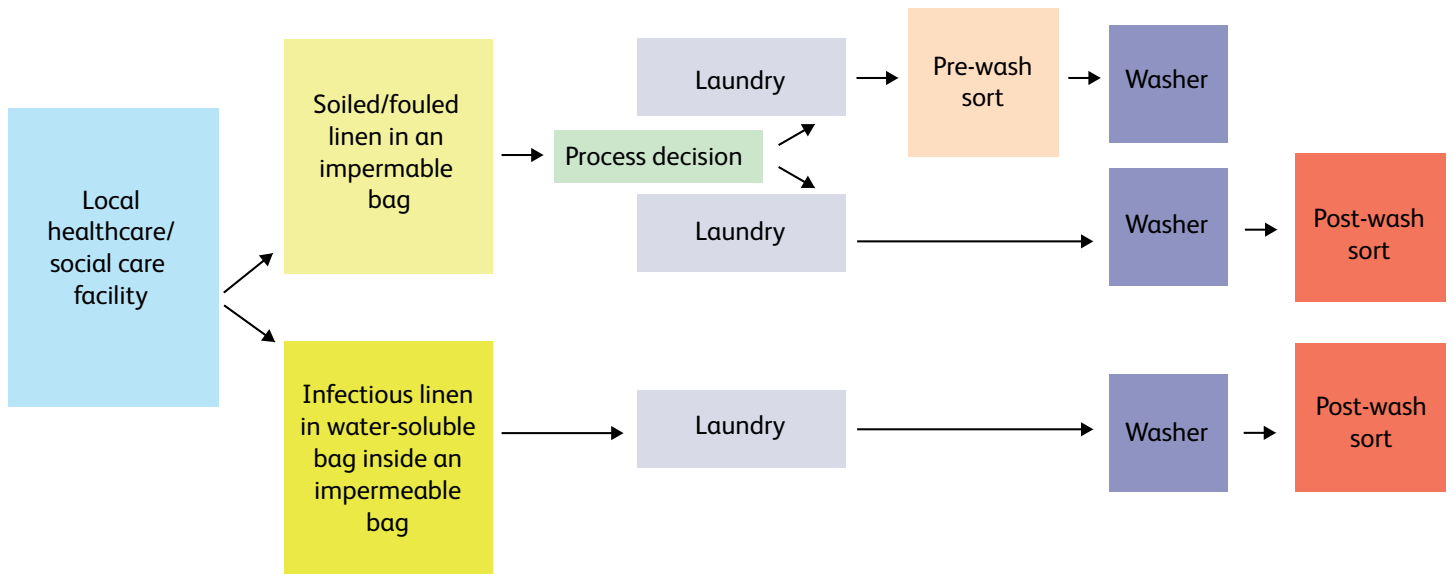
5.26 Water-soluble bags should be transferred to the designated washer without opening, followed by any washable, reusable laundry outer bag, which should be washed in a similar fashion. If a CTW is used, it should be validated to determine its ability to process and breakdown adequately the water-soluble bag.

#### *Option 2: Standard precautions by the user with no segregation of linen*

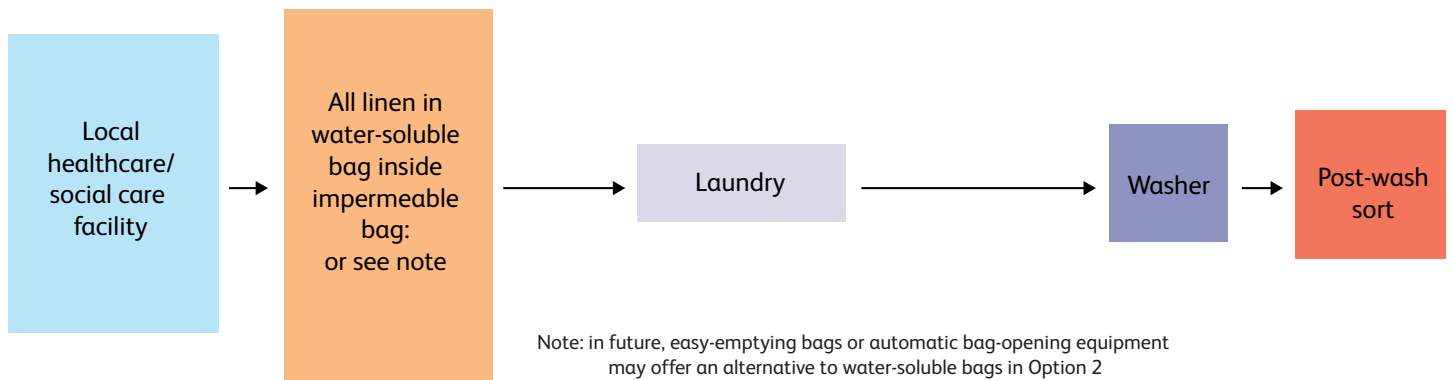
5.27 Linen is not segregated at the local level (subject to the laundry being able to meet processing guidelines), and all linen is presumed to be infectious.

\* Bags with water-soluble seams are also included within this term but should only be used with the linen processor’s agreement in order to prevent damage to tumbler-drying equipment

Figure 1 Classification and sorting flowchart

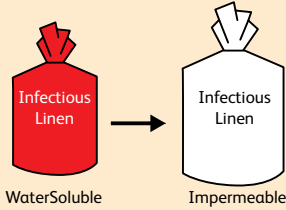
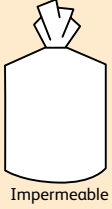
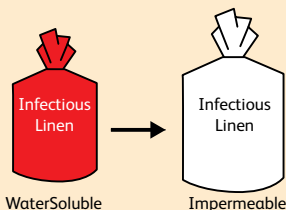
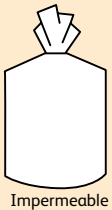


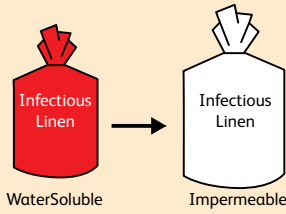
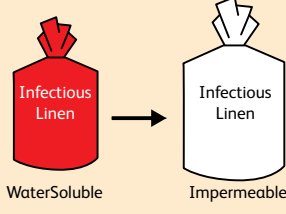

Option 1 - Local policy requires that infectious linen be segregated by the service users



Option 2 - local policy requires standard precautions by the user with no segregation of linen

5

Option and processing plant available:	Category	Bag /container (see paragraph 5.41 colour coding linen bags)	Production sort system
Option 1 with CTW for soiled/fouled, and dedicated W/E for infectious	Infectious (W/E)	Water-soluble bags inside impermeable outer: 	Post
	Soiled or fouled (CTW)	Impermeable: 	Pre or post
Option 1 with CTW for all categories	Infectious	Water-soluble bags inside impermeable outer: 	Post
	Soiled or fouled	Impermeable: 	Per or post depending on delivery mechanism to CTW

Option and processing plant available:	Category	Bag /container (see paragraph 5.41 colour coding linen bags)	Production sort system
Option 2 with W/E for all categories		Water-soluble bags inside impermeable outer: 	Post
Option 2 with CTW for all categories		Water-soluble bags inside impermeable outer: 	Post
		Or reusable impermeable (not plastic disposable) using easy-emptying and step conveyor (See note below) 	
Notes: Orange shading refers to options for meeting EQR Blue shading relates to BP progression			
Note: In future, easy emptying bags or automatic bag opening equipment may offer an alternative to water-soluble bags in Option 2			

- 5.28 Immediately on removal from the bed or before leaving a clinical department, linen should be either:
- sealed in a water-soluble bag, which should then be placed in an impermeable bag; or
  - sealed in an impermeable reusable bag having the infectious-linen colour code in accordance with the 'Colour coding of linen bags' section, and labelled, if considered necessary locally.
- 5.29 If a water-soluble bag is used, the inner bag should be transferred to the designated washer without opening.
- 5.30 CTWs are not designed to operate solely on loads involving water-soluble bags and should be validated to determine their ability to process and breakdown adequately the water-soluble bags in sufficient quantities. Before adopting option 2, consideration needs to be given to the total mix of all the laundry's work including that from other healthcare customers. The utilisation of option 2 depends on the percentage of healthcare customers, the availability of washer-extractors and the total percentage of work going through the the CTW that will be in water-soluble bags.
- 5.31 In future, easy-emptying bags or automatic bag opening equipment may offer an alternative to water-soluble bags in option 2. If easy-emptying bags or an automated procedure is adopted, a bag handling procedure should be used that:
- minimises manipulation of the bag and prevents exposure of staff to the infectious linen prior to decontamination;
  - is fully automated for washer loading;
  - incorporates equipment that is capable of being adequately disinfected; and
  - requires any outer bag to be decontaminated before disposal or reuse.
- 5.32 It is not acceptable for staff to manually open bags containing infectious linen.

**Note**

Laundry equipment providers are encouraged to consider developing products that could assist with satisfying this aim

- 5.33 Any systems adopted should not expose the laundry staff to any greater risk than that posed by option 1 above, where water-soluble bags are used.
- 5.34 Further consideration should also be given to disinfection of hoppers and loading chutes.
- 5.35 Whichever classification option is chosen, permeable outer bags should not be used.
- 5.36 Linen is then sorted for further processing on exit of the process.



- 5.37 Whichever option is chosen, post-wash sorting of linen for production purposes (production batch sorting) is encouraged. If any form of pre-wash sorting for operational or performance reasons is required within the laundry, option 1 above should be adopted. It is not appropriate for laundry staff to undertake sorting of infectious linen.
- 5.38 The health and safety of personnel operating washers is important, especially where a CTW is used for processing infectious linen. A documented risk assessment should be undertaken describing how the risk will be dealt with, how the process will be undertaken and what documented procedures will be implemented. It should form part of any quality management, safety or risk analysis system operated by the laundry.
- 5.39 When a machine is used for the processing of infectious linen, the following safety measures need to be adopted. The ability to undertake these measures needs consideration when choosing either option mentioned above:
- Any vent pipes associated with machines processing infectious linen should be routed to a safe point of discharge outside the building and away from any windows or ventilation plant inlets.
  - Effluent from the drains of such machines must be sealed (closed piped) from the machine to the manhole and situated outside the laundry to prevent infection. If the machine drains to an open sump or pit immediately below the machine drain valve, the sump or pit should be covered to reduce the risk of bacteria being spread by aerosol when water is pumped from the machine.
- 5.40 Validation of the ability of the washer to process water-soluble bags should be undertaken if these bag types are being used.

## Colour coding of linen bags

### **Soiled and fouled linen**

- 5.41 Linen not identified as infectious should be placed in a white impermeable bag for despatch to the laundry. A risk assessment should be taken at local level to be assured the containment of soiled and fouled linen is not compromised. All staff at local level should be trained in the correct coding and bagging procedures to ensure that sharps, clinical waste and non-clinical waste do not return to the laundry.

### **Infectious linen**

- 5.42 All linen identified as infectious should be placed in a red water-soluble bag (with an optional bold legend stating “infectious linen”), which should then be placed inside a white impermeable bag which is identified as “infectious linen”.

### Note

If sorting and classification option 2 (see [paragraph 5.8](#), ‘Classification of linen’) is adopted without the use of water-soluble bags (for example, with impermeable reusable bags using easy-emptying and step conveyors), a red impermeable bag should be used and labelled “infectious linen”.

### Heat-labile linen

- 5.43 All heat-labile linen should be placed inside an impermeable bag, the colour of which should be agreed with the laundry.
- 5.44 If option 1 or pre-wash sorting is adopted, infectious red-bagged linen and soiled/ fouled linen should not be mixed within the same outer bag.

## Disinfection of linen

- 5.45 Traditionally, linen has been disinfected using heat. One of the advantages of this method is that time–temperature relationships can easily be set and monitored. However, disinfection by heat may not be suitable for some materials, either because they cannot tolerate high temperatures or because specialised coatings may be damaged by a thermal process. Whichever process is selected, effectiveness at decontaminating items contaminated with heat-resistant organisms such as *Clostridium difficile* or *enterococci* may need to be considered.
- 5.46 Temperatures other than those specifically recommended in the ‘Disinfection by heat’ section, when maintained for an appropriate time, are acceptable and will also be capable of producing a disinfected product. For a thermal disinfection process, a particular time at a particular temperature can be expected to have a predictable lethal effect against a standardised population of organisms.
- 5.47 Energy and environmental impact should also be considered when selecting an appropriate process.
- 5.48 Others processes use a combination of raised temperature (but less than 65°C) and chemical disinfection. These processes, often termed “chemo-thermal” disinfection, are gaining popularity and are constantly being developed into more sophisticated processes. The term “chemical disinfection” is used throughout this WHTM and includes such processes as well as any chemical processes operating at ambient temperature.
- 5.49 An additional pre-wash cycle may be necessary for heavily-soiled/infectious linen processed in washer-extractors. The use of this additional stage should be recorded in the local policy.

### Disinfection by heat

- 5.50 The washing process should have a disinfection cycle in which the temperature of the load is either maintained at 65°C for not less than ten minutes or 71°C for not less than three minutes when thermal disinfection is used. Alternative time-temperature relationships may be used as long as the efficacy of the process chosen is equal to or exceeds that of the 65° or 71°C processes. With all these options, mixing time should be added to ensure heat penetration and assure disinfection. For conventionally-designed machines and those with a low degree of loading (less than 0.056 kg/L), four minutes should be added to these times to allow for adequate mixing time. For a heavy degree of loading (that is, above 0.056 kg/L), it is necessary to add eight minutes.
- 5.51 The routine validation of achievement of the above parameters is important. The adoption of recommendations in the 'Engineering, equipment and validation' volume of this WHTM could assist in demonstrating compliance.

#### Note

The *All Wales NHS dress code: free to lead, free to care* (Welsh Assembly Government 2010) offers advice on home-laundrying of uniforms in domestic facilities, but states, 'wash uniforms ... at the hottest temperature suitable for the fabric'. It then recommends a ten-minute wash at 60°C. The time-temperature relationship discussed in this section is not applied to the domestic laundering setting. The level of soiling (due to the use of PPE), direct contact time with the service-user and therefore overall risk is less for uniforms and workwear than it is for other types of linen such as sheets and drapes.

### Chemical disinfection including chemo-thermal processes

- 5.52 This process is essential for some heat-labile items. A variety of processes using a range of chemical agents are available, and the exact process should be chosen in discussion and agreement with the infection control team for a care provider and with the appointed Microbiologist (Decontamination).
- 5.53 It is important that the chemical does not damage fire-retardant or other specialist coatings. Hypochlorite should not be used on fabrics treated for fire retardance.
- 5.54 Chemical disinfection processes also need to be validated, but traditional time-temperature relationships are not applicable. The entire process (including washing, dilution and disinfection) should be capable of passing the microbiological tests specified within this WHTM, including the ability to process a sterile swatch and leave it free of viable microorganisms (see 'Microbiological test for disinfection stage' in the 'Engineering, equipment and validation' volume). In addition, a method for proving a disinfecting efficacy equal to or exceeding that of the 65° or 71°C thermal disinfection processes using semi-permeable dose strips is specified in this WHTM (see 'Microbiological test for disinfection stage' in the 'Engineering, equipment and validation' volume).

### ***Clostridium difficile* contamination and potential infection**

- 5.55 The Department of Health has undertaken a series of three studies in collaboration with University College London and the laundry industry concerning an assessment of the risk of possible presence and persistence of *Clostridium difficile* spores after the completion of linen decontamination processes.
- 5.56 The studies focused on:
- the potential for contamination in the use of linen with particular reference to bed sheets;
  - the effectiveness of small washers in the removal of such contamination, and similar studies involving industrial-scale processes with CTWs;
  - the potential for any residual *Clostridium difficile* contamination to be released from linen when in the sustained presence of a patient's saliva (acting as a continuous contaminant).
- 5.57 The studies show that *Clostridium difficile* contamination occurs from colonised and/or infected patients at significant levels. This contamination is not necessarily linked to the presence of visible soil on the linen concerned.
- 5.58 A standard washer-extractor is highly effective in reducing the extent of contamination present at the end of the linen decontamination process provided that the quality requirements match those within this guidance.
- 5.59 Additional tests have shown that CTWs are more effective than standard washer-extractors. However, low-level contamination of linen will persist if the initial level of *Clostridium difficile* spore contamination is high, irrespective of which type of machine/process is used.
- 5.60 DH concludes, subject to future review, that the guidance offered in this WHTM when properly applied as part of a quality system does give adequate and reliable safeguard against the spread of this form of contamination/infection for the purpose of general hospital care.
- 5.61 In the case of highly immunosuppressed or compromised patients, the advice of a clinical microbiologist should be sought. It may be appropriate to consider the use of disposable single-use products.

#### **Note**

A review by Creamer and Humphreys (2008) did not identify any outbreaks of *Clostridium difficile* infection that were linked to contaminated linen (although it included a list of published outbreaks linked to bed components).

However, there have been two published reports linking *Bacillus cereus* contamination of linen with hospital infection (Barrie *et al* 1994 and Sasahara *et al* 2011).

## Continuous tunnel washers – disinfection

- 5.62 All CTWs should be fitted with the necessary controls and interlocks to ensure work being processed is not recontaminated during the rinsing stages of the wash process. To achieve this, rinse sections should be disinfected before production starts each working day.
- 5.63 The apparatus used to disinfect rinse sections of the CTW should be interlocked with the normal running control of the machine. This is to prevent the machine being set to work before the disinfection of these stages has been satisfactorily completed. The requirements are as follows
- For machines using thermal disinfection, all sections of the machines that follow the high temperature sections which do not reach a minimum temperature of 65°C should receive a thermal disinfection cycle. The disinfection cycle will be considered satisfactory when the water temperature has been raised to 65°C and held at this temperature for a period of not less than ten minutes or at a temperature of 71°C for a period of not less than three minutes. During thermal disinfection of the rinse stages, the machine cage/drum should rotate to ensure that all surfaces are in contact with high-temperature liquids. The disinfection process should be controlled by a timer.
  - For machines using chemical disinfection, all sections of the machines that follow the disinfection section which do not normally receive disinfection should receive a disinfection cycle. The disinfection cycle will be considered satisfactory when the requirements given in [paragraph 5.52](#), 'Chemical disinfection including chemo-thermal processes' are achieved. During disinfection of the rinse stages, all surfaces should be in contact with the disinfectant.
  - A machine using chemical disinfection for its main linen disinfection process can use thermal disinfection for its rinse- and cool-stage disinfection process if needed.
  - A timer should be incorporated into the control system to override the need to proceed through the disinfection of the cool stages if the machine is stopped for short periods during the day. This timer however, should be interconnected such that if the machine is shut down for a period of three hours or more, the cool stage disinfection cycle will proceed and simultaneously lock out the washing controls. The lock out should include any mechanical devices, interlocked with the washing cycle or not, for feeding work into the machine.
  - The cool stage disinfection cycle should be initiated by a single button. The cycling of any steam and/or water control valves necessary to raise the temperature of these stages to that required for thermal disinfection or the admittance and control of any chemical disinfectant should be automatic. The incorporation of hand-operated valves in this system is not acceptable.
- 5.64 For washing machines without thermal interlocks, all linen should be run out at the end of the day to avoid recontamination, should normal machine disinfection processes not be enough to prevent this (otherwise bacterial growth may occur overnight).

### **Other disinfection considerations**

- 5.65 Adequate disinfection procedures should be in place for the tanks that are used to collect water for reuse within the CTW.
- 5.66 If the installation of a heat exchanger in the recovered water system is envisaged, special consideration to thermal disinfection needs should be given.
- 5.67 Machinery should be kept clean and free from algae and biofilm (for example, any slime layers).
- 5.68 All conveyor belting and surfaces used to transfer clean processed work from the press/ extraction device to tumblers should be regularly cleaned and disinfected.

## Continuous tunnel washers – safe operation

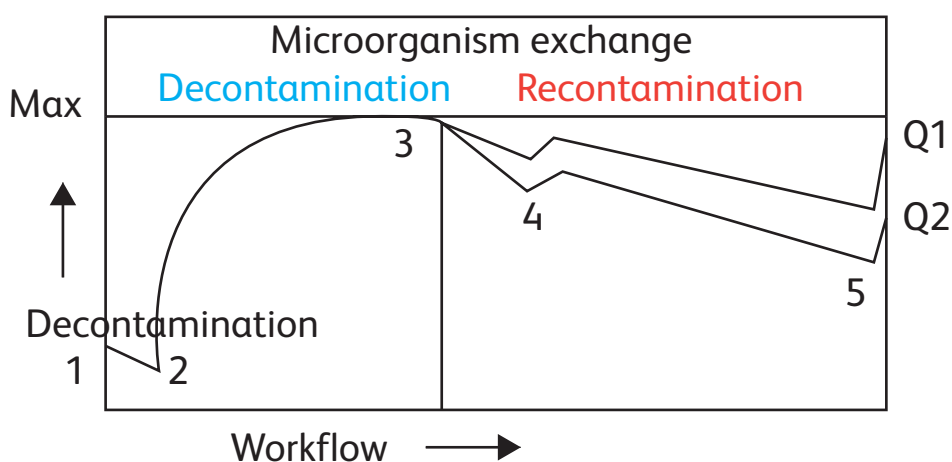
- 5.69 The *Code of practice for the safe operation of continuous tunnel washers* (TSA & SLEAT 2014) should be adopted as the minimum standard for safe operation by all organisations using CTWs.

## Risk analysis and biocontamination control (including critical control points and recontamination)

- 5.70 All linen processors who process infectious linen should undertake a risk analysis of their processes including identifying areas requiring microbiological control and setting and measuring critical control points.
- 5.71 Particular attention should be paid to those areas or transmission routes where recontamination of linen can occur (with special regard to potential recontamination from unprocessed healthcare linen); but all steps of the process should be considered within the analysis. BS EN 14065:2016 provides an outline of a suitable system that may be adopted by linen processors and its implementation and external verification is encouraged by the Welsh Government. It describes an RABC system designed to enable laundries to continuously assure the microbiological quality of processed textiles.
- 5.72 The following diagram shows a schematic illustration of decontamination status during processing.
- 5.73 Further information is given in the ‘Guidance for linen processors implementing BS EN 14065’ volume of this WHTM 01-04 series.

## Separation of process to prevent recontamination

- 5.74 For those that have not yet achieved independently certified biocontamination control systems in accordance with BS EN 14065:2016, the soiled linen area should be functionally separated from the clean linen processing areas.
- 5.75 Examples of how functional separation may be obtained are:
- physical barrier;
  - negative air pressure in the soiled linen area; and/or
  - positive air flow from the clean textiles area through the soiled textiles area with venting directly to the outside.



Key:

- 1 – soiled receipt
- 2 – delay before washing
- 3 – end point of main wash process, before rinsing
- 4 – end point of drying process
- 5 – completion of packaging
- Q1 and Q2 – different quality (microbial) levels, from variation in process and product

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## Protection of laundry staff

- 5.76 Managers should assess whether the risks associated with linen decontamination require the use of personal protective equipment (PPE).
- 5.77 Although pre-wash sorting is not the preferred option, where it does occur, staff in sorting areas must wear PPE (for example, waterproof coverage of chest and forearm areas, gloves, and possibly visors, face-masks or hats, depending on the task being undertaken).
- 5.78 Any exposed lesion should always be covered with a waterproof dressing. Hand-washing and changing facilities must be provided in accordance with current legislation. Clean overalls should be available to staff at each new shift or work-period change.
- 5.79 Staff need to discard and replace PPE between work tasks and especially when moving from dirty to clean areas. Staff should not wear their own home clothes, but should be provided with appropriate workwear.
- 5.80 Staff should be fully trained in all operations involving linen processing. Guidelines setting out cleaning and operational procedures for plant, equipment and laundry buildings should be made available and adhered to. Detailed policy on the occupational health supervision of laundry staff should be determined locally. Common issues identified that may require specific measures include:
- maintenance of laundry cages;
  - upper limb disorders;
  - manual handling;
  - slips and trips;
  - safe maintenance of automated systems.
- 5.81 Immunisation (vaccination) is available against hepatitis B virus but not other blood-borne viruses. The need for laundry staff and other staff handling linen to be immunised should be determined by risk assessment. It should only be seen as a supplement to reinforce other control measures.
- 5.82 Employers should make vaccines available free of charge to employees if they are needed. It is recommended that a vaccination record is kept.
- 5.83 Further information on immunisation can be found in publications by the Advisory Committee on Dangerous Pathogens and the Department of Health.



- 5.84 Advice on undertaking the risk assessment can be found in the *Blood-borne viruses in the workplace* (HSE 2011b)

## Transport of linen

- 5.85 Bags should not be overfilled. They should be of an acceptable weight and should be securely fastened before being sent to the laundry. Care should be taken to prevent linen or foul seepage (body fluids or blood) escaping from laundry bags and contaminating other items or staff.
- 5.86 If used to transport clean linen after transporting used or infectious linen, all reusable transport containers, cages and the inside hold area of transport vehicles should be decontaminated daily and between uses in order to ensure that the condition and decontaminated status of the linen is not compromised. This should be undertaken according to a documented procedure and the process validated. The use of easy-to-clean impervious smooth surfaces will aid this process.
- 5.87 There should be a physical barrier between clean and used or infectious linen when carried on a vehicle at the same time. Linen bags that are not securely fastened should not be placed in a vehicle.
- 5.88 Trolleys for clean linen in transit should be covered with a washable or disposable cover. If fully enclosed and sealed containers with lockable doors are used, these covers are not required.
- 5.89 See also [paragraph 2.7](#), 'Application of the Carriage Regulations to used linen'.

## Clean linen storage and prevention of recontamination

- 5.90 Storage areas should be dedicated for the purpose and not used for other activities. The storage area should be appropriately designed to prevent damage to linen and to allow for the rotation of stocks.
- 5.91 Laundry rooms, central linen rooms, linen rooms, linen cupboards and mobile storage units should be equipped with shelving that can be easily cleaned and allow the free movement of air around the stored linen. Linen should be stored above floor level away from direct sunlight and water in a secure, dry and cool environment.
- 5.92 Cleaning frequencies should be agreed locally but should be at least quarterly.
- 5.93 Linen stocks should be removed temporarily to facilitate thorough cleaning of the storage area and shelving.
- 5.94 Clean linen should be transported around wards on a clean trolley and handled with clean hands.



## Chapter 6

# Options for the provision of linen processing services

## Summary

**It is recognised that organisations can determine the most suitable means of providing linen processing services. However in doing so, those organisations may wish to pay due regard to the standards set out in this WHTM.**

**This section provides an overview of the issues that are likely to be considered by organisations when deciding upon the most suitable method of providing a linen processing service.**

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- 6.1 Organisations can determine the most suitable means of providing linen processing services by undertaking an options appraisal, whereby they quantify and (where possible) value the costs, benefits, risks and uncertainties associated with each of the following options:
- a. procure a new build;
  - b. upgrade existing facilities;
  - c. obtain services from a third party;
  - d. maintain existing compliant services.
- 6.2 Issues to consider include:
- Do existing laundry facilities have equipment of adequate capacity to cope with an increased demand according to organisation growth forecasts?
  - Can other equipment be utilised for infectious linen to mitigate the effects of growth in demand?
  - In particular for healthcare settings, are other laundry-stream demands expected to decrease because of a reduction of other clinical work in the hospital; and has this been considered in balancing demand?
  - Have relationships with other organisations/laundries been established to develop contingency arrangements for support in terms of laundry capacity?

6.3 If looking to outsource provision, the scope of service required needs consideration. Options include:

- wash and return only;
- linen hire;
- total linen management;
- hire of CE-marked reusable barrier theatre textiles;
- combinations of the above.

6.4 If choosing a new build, the following issues may be taken into consideration when determining the location of the laundry:

- availability of site/premises;
- distance from main users;
- revenue and capital costs;
- transport requirements/constraints;
- textile inventory;
- quality and quantity of engineering services;
- personnel issues;
- security issues;
- planning permission requirement;
- health/social care providers' strategies; and
- geographical and environmental constraints.



## Chapter 7

# Procurement of medical device textiles and processing instructions

## Summary

**Organisations must have a clear understanding of the relevant Essential Requirements of the Medical Devices Directive, BS EN ISO 13485:2016 and the BS EN 13795:2007 series in order to develop a purchasing policy for Class 1 textile medical devices. This should include a consultation process to ensure that all those involved in the purchase, decontamination and use of the device are given the opportunity to discuss the suitability of an item before a purchase is made.**

**This understanding, policy and consultation will ensure that textile medical devices that have been purchased may be adequately decontaminated by processes available to the organisation.**

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- 7.1 When considering the purchase of textiles and specifically those that are medical devices, the following issues should be taken into account:
- Does the textile have a limited life? Is this specified by the manufacturer?
  - What method of linen processing does the manufacturer recommend, and is this process available within the organisation?
  - Is the textile heat-labile, and is an alternative available that will withstand higher wash temperatures?
  - What processing agents are recommended? Do these comply with local infection control policies, COSHH and health and safety requirements?
  - If the textile needs to be sterilised, is the preferred method of steam sterilisation (134°C for a minimum of three minutes) recommended? If another method of sterilisation is recommended, is this available within the organisation?
  - Has a risk assessment been undertaken to determine whether a single-use or a reusable product is more appropriate for the circumstances?
- 7.2 Manufacturers of reusable medical devices are required to supply information on the appropriate decontamination process to allow reuse, including washing, disinfection and where appropriate the method of sterilisation.



## References

### Acts and regulations

*Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009, SI 2009 no 0348*

<http://www.legislation.gov.uk/uksi/2009/1348/introduction/made>

*Climate Change Agreements (Eligible Facilities) Regulations 2012, SI 2012 No 2999*

<http://www.legislation.gov.uk/uksi/2012/2999/contents/made>

*Consumer Protection Act 1987*

<http://www.legislation.gov.uk/ukpga/1987/43/contents>

*Control of Substances Hazardous to Health Regulations 2002 (COSHH), SI 2002 No 2677*

<http://www.legislation.gov.uk/uksi/2002/2677/contents/made>

*Health and Safety at Work etc. Act 1974*

<http://www.legislation.gov.uk/ukpga/1974/37/contents>

*Council Directive (EEC) 93/42 of 14 June 1993 concerning medical devices [1993] OJ /169 [Medical Devices Directive]*

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31993L0042:EN:HTML>

*Finance Act 2000*

<http://www.legislation.gov.uk/ukpga/2000/17/contents>

*National Health Service (Wales) Act 2006*

<http://www.legislation.gov.uk/ukpga/2006/42/contents>

*Personal Protective Equipment at Work Regulations 1992, SI 1992 No 2966*

<http://www.legislation.gov.uk/uksi/1992/2966/introduction/made>

*Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR), 2013 No1471*

<http://www.legislation.gov.uk/uksi/2013/1471/contents/made>



## British Standards Institution

The latest version of any standard should be used, provided that it continues to address the relevant requirements of these recommendations <http://shop.bsigroup.com/en/>

BS EN 13795:2007 [Parts 1-7] *Thermal spraying. Acceptance inspection of thermal spraying equipment*

BS EN 14065:2016 *Textiles. Laundry processed textiles. Biocontamination control system*

BS EN ISO 9000:2015 *Quality management systems. Fundamentals and vocabulary*

BS EN ISO 13485:2016 *Medical devices. Quality management systems. Requirements for regulatory purposes*

BS EN ISO 14698-1:2003 *Cleanrooms and associated controlled environments. Biocontamination control. General principles and methods*

BS EN ISO 14698-2:2003 *Cleanrooms and associated controlled environments. Biocontamination control. Evaluation and interpretation of biocontamination data*

## NHS Wales Shared Services Partnership - Specialist Estates Services

Health Technical Memoranda (HTMs) and Health Building Notes (HBNs) issued by the Department of Health in England are being superseded by specific Welsh editions which will be titled Welsh Health Technical Memoranda (WHTMs) and Welsh Health Building Notes (WHBNs) and which will use the same numerical coding. The guidelines referenced below were the most recent at time of publication; however, **the latest version should always be used, provided that it continues to address the relevant requirements of these recommendations.** All are available from the NHS Wales Shared Services Partnership – Specialist Estates Services websites:

Intranet: <http://howis.wales.nhs.uk/sites3/page.cfm?orgid=254&pid=39106>

Internet: <http://www.wales.nhs.uk/sites3/page.cfm?orgid=254&pid=6142>

### Welsh Health Building Notes (HBN & WHBN)

\*HBN 00-07:2006 *Planning for a resilient healthcare estate.*



## Welsh Health Technical Memoranda (HTM & WHTM)

HTM 07-02 Part A:2015 *EnCO<sub>2</sub>de - making energy work in healthcare. Environment and sustainability. Part A: Policy and management*

HTM 07-02 Part B:2015 *EnCO<sub>2</sub>de - making energy work in healthcare. Environment and sustainability. Part B: Procurement and energy considerations for new and existing building facilities*

WHTM 00:2014 *Policies and principles of healthcare engineering.*

WHTM 01-01 Part A:2013 *Decontamination of medical devices within acute service. Part A: Management and environment*

WHTM 01-05:2014 *Decontamination in primary care dental practices and community dental services*

WHTM 07-01:2013 *Safe management of healthcare waste*

\*New guidelines are due out later in 2017. Please check the URL above for the latest guidelines.

## Welsh Health Circular

WHC (2015)015 *Health and Care Standards*

<http://gov.wales/docs/dhss/publications/150511whc015en.pdf>

## Other publications

Advisory Committee on Dangerous Pathogens (2005a). *Biological agents: managing the risks in the laboratory and healthcare premises*. London: HSE

<http://www.hse.gov.uk/biosafety/biologagents.pdf>

Advisory Committee on Dangerous Pathogens (2005b). *Management of Hazard Group 4 viral haemorrhagic fevers and similar human infectious diseases of high consequence*. London: HSE

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HSE <http://www.hse.gov.uk/pubns/misc208.pdf>

(HSE 2013b). *Reporting accidents and incidents at work. A brief guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR)*. London:  
HSE <http://www.hse.gov.uk/pubns/indg453.pdf>

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