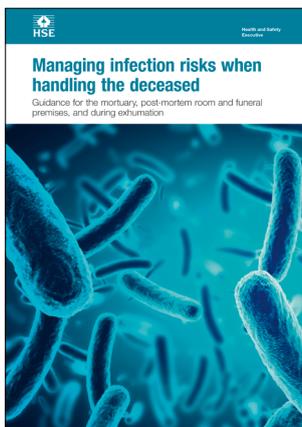


Managing infection risks when handling the deceased

Guidance for the mortuary, post-mortem room and funeral premises, and during exhumation



HSG283

This publication provides guidance on managing the risks of infection from work activities which involve handling the deceased. It covers the safe handling, storage and examination of bodies and pathological specimens in hospitals, mortuaries and post-mortem rooms. It also provides guidance for those involved in funeral services (including embalmers) and exhumations of human remains.

It updates and combines previous HSE guidance, *Safe working and the prevention of infection in the mortuary and post-mortem room* (2003) and *Controlling the risks of infection at work from human remains* (2005), based on a review of scientific knowledge, stakeholder feedback and experience of how the previous guidance was used in the workplace.



Published by TSO (The Stationery Office), part of Williams Lea Tag,
and available from:

Online

<https://books.hse.gov.uk/>

Mail, Telephone, Fax & E-mail

TSO

PO Box 29, Norwich, NR3 1GN

Telephone orders/General enquiries: 0333 202 5070

Fax orders: 0333 202 5080

E-mail: customer.services@tso.co.uk

Textphone 0333 202 5077

TSO@Blackwell and other Accredited Agents

Published with the permission of the Health and Safety Executive on behalf of the Controller of Her Majesty's Stationery Office.

© Crown copyright 2018

First published 2018

ISBN 978 0 7176 66768

This information is licensed under the Open Government Licence v3.0. To view this licence, visit
<http://www.nationalarchives.gov.uk/doc/open-government-licence/> **OGL**

Any enquiries regarding this publication should be sent to: copyright@hse.gov.uk

Some images and illustrations in this publication may not be owned by the Crown and cannot be reproduced without permission of the copyright owner. Where we have identified any third party copyright information you will need to obtain permission from the copyright holders concerned. Enquiries should be sent to copyright@hse.gov.uk

Printed in the United Kingdom for The Stationery Office.

J003462029 c0.75 08/18

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

Contents

Introduction	5
Risk assessment	9
Training and competence	14
Infection control precautions	17
Collection, transport and transfer of information related to the deceased	23
Managing the risks of infection in the post-mortem room and mortuary	27
Managing the risks of infection in funeral premises	37
Managing the risks of infection during exhumations	44
Appendix 1: Application of transmission-based precautions to key infections in the deceased	48
Appendix 2: Hazard notification sheet	51
Appendix 3: Cleaning and disinfection	53
Appendix 4: Health surveillance and immunisation	55
Appendix 5: Managing exposure and post-exposure prophylaxis	57
Appendix 6: Dealing with incidents and accidents	58
Glossary	59
References	61
Further reading	63
Acknowledgements	64
Further information	65

Introduction

What is the purpose of the guidance and who is it aimed at?

1 This publication provides guidance on managing the risks of infection when handling the deceased. It is aimed at those working in:

- the mortuary and post-mortem room – anatomical pathology technologists (APTs) and pathologists;
- funeral services – funeral directors and their staff, including embalmers;
- exhumations – cemetery employees, environmental health officers; archaeological researchers and redevelopment/construction companies.

2 Although this guidance focuses on managing the risks of infection, other risks including manual handling (eg moving bodies), use of chemicals (eg disinfectants and embalming fluid), and radioactive seeds (eg prostate implants) will also need to be considered.

3 Additionally, deaths resulting from workplace accidents or other incidents involving exposure to chemicals or other harmful substances (eg crime scenes) may present an increased chemical or radiological exposure risk to people performing post-mortem examinations and embalming, and this risk should also be considered. The College of Policing provides guidance on dealing with contaminated deaths on its website at <https://www.app.college.police.uk/app-content/civil-emergencies>; this may be of interest to police officers attending chemical, biological, radiation or nuclear (CBRN) incidents. Although such circumstances are rare, they need to be assessed on a case-by-case basis.

4 This guidance may also be useful for people who come into contact with the deceased through their work activities, such as ambulance workers, the police, general practitioners, porters and domestic cleaners.

5 The guidance does not cover crime scene investigations, road traffic accidents, industrial accidents or infection control with regard to patient safety.

How to use the guidance

6 The guidance is structured to reflect the pathway of the deceased from death through to burial, cremation and, where required, exhumation. It considers the risks of infection that may be present along that pathway (see Figure 1). Each section of the guidance is intended to reflect one stage in the pathway, so some will be more relevant to you than others.

7 The pathway is colour-coded to help direct you through the guidance (see the key for details). This makes sure that focus is directed to the areas most relevant to a particular work activity. Some sections of the guidance are common to all aspects of managing the risks of infection from the deceased, and will be relevant to all.

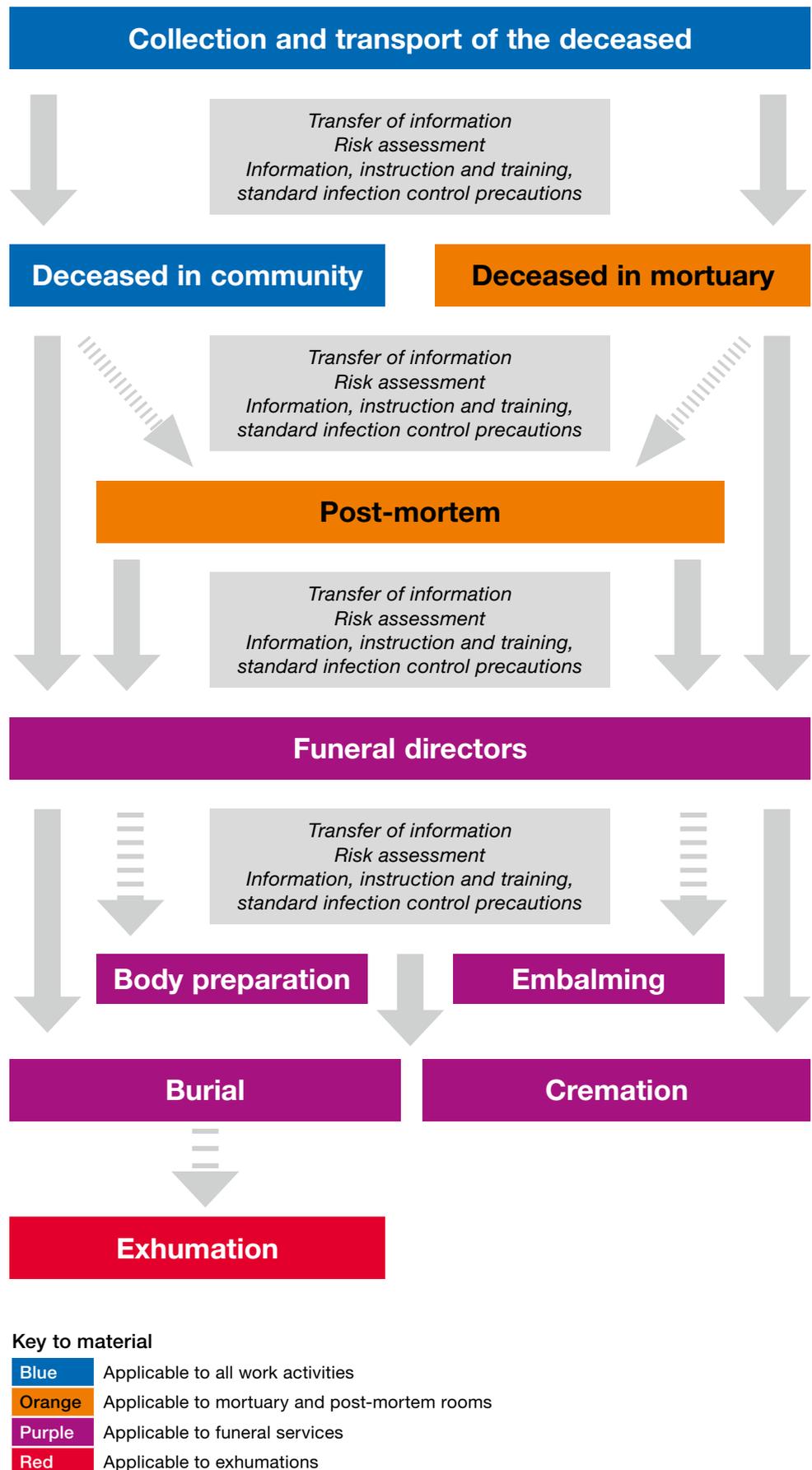


Figure 1 Pathway of the deceased

Risk of infection from the deceased

8 Workers in a range of different occupations are required to handle the deceased at various stages of the pathway from death to burial or cremation. As such they may be exposed to a risk of infection, including during preparation of the deceased by funeral service staff, at post-mortem examination and, in restricted circumstances, during exhumation.

9 In the UK, a relatively small number of deaths each year (approximately 70,000) are linked to infectious diseases. However, some people may also present an infection risk where they were undiagnosed or asymptomatic with an infectious disease at the time of death.

10 This guidance advises on how to manage the risks of infection using the principles of standard infection control precautions (SICPs) and transmission-based precautions (TBPs). The term 'standard infection control precautions' is used to describe the minimum control measures that should be implemented to manage the risk of exposure from all work activities involving the deceased. For some activities that present an increased risk of infection, additional measures are required – these are referred to as 'transmission-based precautions'. Further information about what is meant by these terms is provided in paragraphs 59–98.

11 Appendix 1 provides a non-exhaustive list of infections that may be found in the deceased. It advises on whether you may carry out certain activities and indicates where to apply specific TBPs. However, you must also do a risk assessment to find out whether the risk of infection can be adequately managed. It is important to consider the route of transmission, then identify and apply the appropriate TBPs.

What are the legal duties?

12 Duties under the Health and Safety at Work etc Act 1974¹ apply to the risks of infection that may arise from work activities. If you are self-employed and employ others the law will apply to you. However, if you are self-employed and your work activity poses no potential risk to the health and safety of other workers or people, health and safety law does not apply to you. For more information, see HSE guidance on the self-employed at www.hse.gov.uk/self-employed.

13 The Management of Health and Safety at Work Regulations 1999² provide a broad framework for managing health and safety at work. This extends to a responsibility for employers sharing work premises to co-ordinate and co-operate. Because different professions are involved during the pathway of the deceased, there must be an adequate and appropriate exchange of information between the people involved at different stages. This information is required to complete a suitable and sufficient risk assessment, leading to the effective control of infection risks from the deceased.

14 More specifically, the Control of Substances Hazardous to Health (COSHH) Regulations 2002³ provide a framework of actions designed to control the risk from a range of hazardous substances, including infectious microorganisms (defined as 'biological agents' in COSHH).

15 COSHH requires employers to consider the hazards to human health associated with work activities, and how exposure to harmful substances (eg microorganisms) can be adequately controlled. This guidance is intended to help employers to:

- identify and assess the risks based on the information they are given;
- take precautions to eliminate or adequately control the risks;
- prepare and implement effective and safe working practices, which set out the procedures and precautions that all employees, contractors' staff and visitors on their premises must take.

16 All employers are required under COSHH to make sure that risks from sharps injuries are adequately assessed and that appropriate control measures are in place. The Health and Safety (Sharp Instruments in Healthcare) Regulations 2013⁴ (the 'Sharps Regulations') build on the existing law and provide specific detail on requirements that must be taken by healthcare employers and their contractors.

17 The Sharps Regulations require employers in the healthcare sector to use safer sharps where the use of sharps is unavoidable. 'Safer sharps' means medical sharps with features or mechanisms to prevent or minimise the risk of accidental injury. Although the Sharps Regulations apply only in healthcare settings, they are an effective means of managing the risk of infection from sharps in non-healthcare settings. *Health and Safety (Sharp Instruments in Healthcare) Regulations 2013: Guidance for employers and employees*⁵ provides further information.

18 As an employer, you have a duty under health and safety law to consult your employees about health and safety matters; this includes safety and union representatives. As well as giving employees information, you should listen and take account of what employees say before making any health and safety decisions. Employees may be able to tell you about hazards that they have come across at work and help with the risk assessment process.

Risk assessment

19 This section is aimed at all those involved in handling the deceased and explains the process of carrying out a risk assessment. More detailed information about the risks arising from specific activities is given in the relevant sections.

Assessing and controlling the risks

20 As part of managing the health and safety of your business, you must control the risks in your workplace. To do this you need to think about what might cause harm to people and decide whether you are doing enough to prevent that. This is known as risk assessment and you are required by law to carry it out. If you have fewer than five employees you do not have to write anything down; however, it is useful to do this so you can review it at a later date; for example, if something changes.

21 Risk assessment is about identifying, and taking sensible and proportionate measures to control, the risks in your workplace; it is not about creating huge amounts of paperwork. You are probably already taking steps to protect your employees, but your risk assessment will help you to communicate important information to them and help you to decide whether you should be doing more.

22 Anyone carrying out a risk assessment should be competent to do so. This includes having a comprehensive knowledge of workplace activities, the hazards involved and the ways in which they can harm people as well as the probability of a hazard occurring. They should also know the minimum standards of risk control required by law and how to achieve them.

Controlling the risks of infection

23 When considering how to control the risks of infection, it may be useful to compare infection to the links in a chain (see Figure 2). Breaking a link in the chain at any point will often control the risk of infection. When you identify the hazard, you should find out about the links in the chain to help you identify the best way to break the chain and so control the risk.



Figure 2 Chain of infection

Sources

24 There are four main sources of infection that you should consider when handling the deceased:

- blood and other body fluids (eg saliva, pleural fluids);
- waste products, such as faeces and urine;
- aerosols of infectious material, which may be released when moving or opening the body;
- direct contact with tissues (eg skin).

Transmission

25 In order for a person to become infected, the microorganism has to get from the source into the host by some means. Most microorganisms usually have a particular route of entry, but in some cases infection can occur by more than one route. Infection can occur via:

- **Airborne transmission** – breathing in small airborne particles (aerosols) from the air which can be generated from work procedures (eg post-mortem procedures involving high-speed devices such as oscillating cutting equipment);
- **Droplet transmission** – splashes or spraying of body fluids (eg blood) that contact the mucosal surfaces of the eyes, nose or mouth (eg generated during moving or opening the body);
- **Contact transmission** – either by direct contact with contaminated fluids or indirect contact with contaminated equipment or materials (eg needlesticks).

The host

26 Unbroken skin and the lining of the mouth, throat, gut and airways provide a barrier to infection. The cells of these linings and other substances they produce are the body's first line of defence. If a microorganism manages to cross the barrier, the next line of defence is the immune system. Whether an infection occurs depends on the outcome of a contest between the microorganism and the immune system.

27 Some people may be naturally immune to some infectious diseases; for example, because they had the disease as a child or have been immunised. Some people may be more susceptible to infection than others; for example, those with reduced immunity because of a pre-existing illness, as a result of some medical treatments, or new and expectant mothers (see HSE guidance on new and expectant mothers at www.hse.gov.uk/mothers). You should check this before employees start work, so that you can make sure they are protected or give them less hazardous work to do (see Appendix 4).

Infections that present an increased risk to people handling the deceased

28 Appendix 1 lists some infections that are known to present an increased risk of infection to those handling the deceased when undertaking certain activities, such as a post-mortem examination or embalming.

29 When a body is known or suspected to be infected with an infection listed in Appendix 1, you should carefully consider whether a post-mortem examination or embalming is necessary. This is because the likelihood of exposure to blood, body fluids or airborne particles is greater and requires additional TBPs to further reduce the risk of exposure.

30 You should make sure that all people coming into contact with the deceased during body transfers, post-mortem examinations, embalming, exhumations etc are fully informed of the risks and that safe working practices are followed.

31 Post-mortem examinations and embalming should not be carried out on the deceased known to be infected with the most hazardous microorganisms (eg *Ebola* virus) except under exceptional circumstances (eg for clinical or medico-legal reasons), and then only by specialised units (see Public Health England guidance, *Ebola: Information for the funeral industry, coroners' offices and pathology departments*).⁶

How to carry out a risk assessment

Identify the hazards

32 You should consider how your employees or others entering your premises might be exposed to a risk of infection. You should identify the hazards and how the activities, processes or microorganisms could cause harm to health. For example, take into account direct contact with the deceased as well as contact with objects such as contaminated sharps, soiled work surfaces, clothing, coffins, soil, vehicles etc that may have become contaminated with infectious microorganisms. Your risk assessment should cover:

- the condition/presentation of the deceased;
- which microorganism(s) may be present;
- the routes of transmission (ie airborne, droplet or contact) and their infectious dose (ie minimum number of microorganisms required to cause infection);
- the information contained in the hazard notification sheet (see Appendix 2);
- the clinical history of the deceased;
- where available, the prevalence of particular infections in the community;
- the nature of any likely contact with the body, including the amount of leakage and potential contamination of clothes, equipment or contact with blood or body fluids;
- the susceptibility of individual people working in the premises;
- the severity of the disease(s);
- health surveillance and immunisation available for staff undertaking the task (ie whether prophylactic treatments are available).

Decide who might be harmed and how

33 For each hazard, you should consider who might be harmed to help identify how best to control the risk. In addition to people directly involved in the work, the assessment should consider people who may be affected by the work; for example, those who may be at increased risk, such as new and expectant mothers or those who may be immunocompromised. People who could be exposed to the deceased or contaminated materials/areas include not only trained staff at your premises but also visitors such as police, students and families of the deceased or contractors, including cleaners.

34 Once you have identified the source(s) and routes of infection in your workplace, you should consider how likely infection is to result from the nature of the work. Your assessment should consider:

- the task being undertaken and how levels of contamination may change (eg they are high during a post-mortem examination or embalming, but low once the post-mortem or embalming room has been cleaned and decontaminated);
- where the task will be carried out, including the local layout and a practical route for movement of work and people;
- whether the task could create aerosols, splashes or will require the use of sharps;

- what equipment will be used, whether equipment is shared and how it will be decontaminated (if not single-use);
- who will carry out the task and whether they are part of any vulnerable group;
- whether others could be affected by the task, eg cleaners or contractors;
- whether the work is routine, one-off, undertaken out of hours and/or by lone workers;
- how much infectious material (ie body fluids) is being handled;
- how many people are exposed.

Evaluate the risks

35 After you have identified the hazards and who may be harmed, you should estimate the level of risk and specify the measures needed to prevent or control exposure as far as reasonably practicable, including making sure that existing precautions are adequate.

36 When deciding whether existing measures are adequate or further controls are necessary, you should evaluate the suitability and effectiveness of working facilities and working practices for staff and others. Where assessments identify the need for improvements, you should plan how to do this and make sure these plans are put into action.

37 As part of your risk assessment, you should consider whether it is possible to eliminate the hazard by:

- changing the way you work so the activity/equipment that exposes your employees to a source of infection is no longer used;*
- modifying your work to remove specific hazardous by-products or waste.

38 If you cannot prevent exposure, then COSHH requires that you adequately control it. This means controlling the risk of infection to a level that will not harm someone's health.

39 Controlling the risks of infection involves a number of basic measures (SICPs) that you should apply to most activities in the areas where work is carried out and to the equipment or tools that are used. Additional measures (TBPs) and/or specific measures may be required for post-mortem examinations, embalming and exhumation, and these are explained in the relevant sections.

40 For control measures to work, you should provide information, instruction and training for your employees so they know about the risks you have identified and the measures you have put in place to control exposure. They need to know and understand when and how to apply the controls, including the use of personal protective equipment (PPE) and what to do in an emergency.

Record your significant findings

41 You should make a record of your significant findings – the hazards, how people might be harmed by them and what you have in place to control the risks. Any record produced should be simple and focused on controls.

42 If you have five or more employees, you are required by law to write down your findings. Employers often incorporate them in their safe working practices. These procedures are then used as working documents for managers, employees and safety representatives.

*For example, developments in technology mean that digital autopsies/body scanning can now be carried out in certain circumstances. However, in many cases this is not sufficiently detailed to replace the need for a physical post-mortem examination.

Review your risk assessment and update it if necessary

43 Employers should review their risk assessments regularly to check that they are still valid. Remember, risk assessments are living documents. They should reflect any changes in the work that you do, and any new equipment that is used or a new work activity if this changes the risk or leads to new hazards being introduced. Some useful things to consider when reviewing are whether:

- safe working practices are relevant to the current work being undertaken at the premises;
- equipment such as PPE for particular activities is available, fit for purpose, worn properly, correctly fitted, stored safely and properly disposed of;
- staff have received appropriate information, instruction and training about their work;
- the system for reporting and responding to accidents, incidents and cases of occupational disease is in place and being followed (see Appendices 5 and 6).

44 It is important to learn from situations when things go wrong. The risk assessments should be reviewed in the light of any accidents or relevant incidents that have occurred.

45 If you identify gaps in your risk assessment you should revise it and make any necessary changes. As an employer you should also make practical checks to ensure that staff and visitors are following safe working practices. By actively monitoring whether systems are working you can improve them rather than wait until something goes wrong. This is an important part of a successful monitoring regime and part of a line manager's responsibility. For more information on managing health and safety and risk assessment, see HSE guidance at www.hse.gov.uk/managing/ and www.hse.gov.uk/risk/index.htm.

Training and competence

46 This section explains and emphasises the importance of providing information, instruction and training to employees, contractors and visitors. They need to know the safe working practices and procedures applicable to them while working in, or attending, the mortuary, post-mortem room, funeral premises or undertaking an exhumation. This section also explains the importance of making sure that employees are competent to carry out activities that may expose them to infectious microorganisms.

47 The extent of the information, instruction and training will vary according to the complexity of the hazards, risks, processes and controls associated with the activity. For example, given the increased risk associated with invasive procedures on the deceased such as post-mortem examination and embalming, the training should be more detailed and supported with appropriately detailed documentation. For more basic activities, such as simple handling of the deceased, the information, instruction and training, as well as records of this having been provided, may be appropriately captured in a single code of practice or local rules. The measures taken to demonstrate competence should be similarly proportionate to the level of risk and complexity of the task.

Information, instruction and training

48 Employers are required to identify particular staff needs, including any gaps in knowledge and/or experience and provide the necessary information, instruction and training. This information could be given in the form of verbal instructions or it may form part of written job instructions/the local code of practice or safe working practices.

49 You should also encourage employees to obtain any relevant vocational and educational qualifications; for example:

- **Anatomical pathology technologist** The Royal Society of Public Health provides the recognised basic qualifications for APTs, the Level 3 and Level 4 diploma in anatomical pathology technology. Qualifications are awarded after assessment by written examination, practical assessment and submission of a portfolio. Higher qualifications have been approved by Modernising Scientific Careers. These qualifications are recognised by the UK Accreditation Service (UKAS).
- **Funeral and embalming industry** The Diploma in Funeral Directing or other relevant qualifications offered by the British Institute of Embalmers, the Institute of Cemetery and Crematorium Management (ICCM) Diploma, the Scottish Vocational Education Council (SCOTVEC) or the Business and Technology Education Council (BTEC).

50 As well as providing information and training for staff regularly involved in routine activities, others who may visit the workplace, such as the police, cleaners or porters, should be provided with appropriate information and instruction on the hazards they may face and what to do about them. This is particularly important where managers are not responsible for the recruitment and supervision of such staff; for example, when work is contracted out.

Competence

51 Completion of a training programme does not automatically mean that users are competent and able to do their job safely. To make sure that risks from work with the deceased are being adequately controlled you should assess the employee's understanding of their information, instruction and training (ie competence). The competence assessment measures a trained user against a set benchmark.

What is competence?

Competence is the combination of training, skills, experience and knowledge that a person has and their ability to apply them to perform a task safely. Other factors, such as attitude and physical ability, can also affect someone's competence.

52 Competence can be assessed in different ways. It can involve simple written or verbal tests of knowledge; observing people using the skill that has been taught; collecting evidence of demonstrated skills for assessment; or setting up an assessment exercise to test how they act and respond to a situation. The method used should be appropriate for the knowledge, skills and competence level needed for the task.

53 Training and assessment are not one-off exercises; unless they are periodically repeated there is a risk that the competence of the users will diminish over time. There is no defined period in which refresher training and assessment should be performed as it will depend on the complexity and risks associated with the work.

Information, instruction and training for handling the deceased with an increased risk of infection

54 Where employees are carrying out invasive procedures, such as post-mortem examinations or embalming, on the deceased known to be or suspected to present a risk of infection (ie the infections listed in Appendix 1), you must provide additional information, instruction and training.

55 Employees may already have done this training as part of the relevant vocational and education qualifications (eg a specific module of a qualification that focuses on increased-risk activities). Alternatively you can assess this based on the employee's level of experience and therefore competence in carrying out these types of procedures and their level of understanding of the risks involved.

Employees carrying out increased-risk activities should:

- be aware of the risks involved with carrying out invasive procedures on the deceased who present an increased risk of infection;
- understand how to implement TBPs;
- be competent in carrying out such procedures;
- make sure the appropriate PPE is worn;
- make sure there is plenty of time to carry out the procedure at a slower rate to prevent contamination and likelihood of exposure to any infection;
- work as part of a team, where required;
- make sure tools and equipment are put in a safe place to prevent any injuries to other members of the team.

Monitoring

56 The overall responsibility for health and safety in mortuaries, post-mortem rooms and funeral services rests with the employer, who can appoint a competent person, including a member of staff, to help them implement the legal requirements. Employers must therefore make arrangements to manage health and safety. This can be done effectively only with line management communication.

57 To carry out their job effectively, designated safety managers need:

- appropriate training in safety procedures and requirements;
- authority from their line management;
- sufficient time to carry out their duties.

58 Many funeral service businesses are likely to be small- to medium-sized and operate using a small team of similarly qualified employees. Even if this is the case, it is possible to allocate responsibility for health and safety to a named member of the team. This may be the premises manager within a small business. The responsible person should make sure that sufficient time has been allowed for health and safety-related planning and decisions.

Infection control precautions

59 Standard infection control precautions (SICPs) were developed to manage the risks of infection from patients in healthcare settings, but they are also applicable as a means of controlling the risks of infection from the deceased. This section also explains when to apply additional precautions, known as transmission-based precautions (TBPs). These have been adapted from *The NHS Scotland national infection prevention and control manual*⁷ and tailored for work with the deceased.

Standard infection control precautions

60 SICPs are the basic infection prevention and control measures that should be used at all times, whether infection is known to be present or not, to ensure the safety of workers and visitors.

61 SICPs are a combination of organisational arrangements, safe working practices, use of PPE, and the application of appropriate behaviours. Their application should take account of the task being performed, the level of interaction and/or the anticipated level of exposure to blood and/or other body fluids.

62 SICPs can be categorised into nine areas which are applicable to work with the deceased:

- safe management of the environment;
- location for handling the deceased and assessment for infection risk;
- PPE;
- hand washing;
- safe management of equipment;
- safe management of blood and body fluid spillages;
- occupational safety: prevention and exposure management (including sharps);
- safe management of linen (including uniforms or work clothing);
- safe disposal of waste (including sharps).

Implementation of standard infection control precautions

Safe management of the environment

63 To minimise the inadvertent spread of contamination by people or equipment in mortuaries, post-mortem rooms and funeral premises, you should ensure that 'clean' and 'dirty' areas and activities are separate. Table 1 provides examples of clean areas, dirty areas and transition zones (these are areas where staff and visitors can change in and out of appropriate PPE before moving between clean and dirty areas).

64 You can separate clean, dirty and transition areas by different means including a physical barrier, signage or floor marking. Where barriers are used they should be clearly visible and minimise unnecessary movement of people and materials within the facility (eg by diverting non-essential activities away from areas where the deceased are handled). You can also minimise contamination of clean areas by implementing a one-way flow from clean to dirty areas.

Table 1 Examples of area separation for infection control

Clean areas	Transition zones	Dirty areas
Reception and waiting areas	Showering facilities	Post-mortem room
Viewing rooms and holding rooms	Washing facilities	Hygienic preparation/embalming room
Stock and linen stores	Storage areas for reusable protective clothing	Utility room (eg housing contaminated materials)
Offices, staff rooms and canteens	Changing rooms	Refrigerators in body storage area
Post-mortem examination observation areas	Clinical waste bin storage area	Soiled protective clothing discard area

65 Warning notices (eg relating to risk of infection) are required at the points of access to and exit from the dirty areas. Where the infection risk is low and separate rooms are not practical (eg due to space constraints), you can devise and implement procedural arrangements to segregate clean and dirty activities. This could involve undertaking the clean and dirty work at different times of the day, interspersed with appropriate cleaning and disinfection steps between the changes of use.

66 Where possible, you should set aside a clean area where employees can take breaks, and prepare and eat food and drink (eg a staff room). This should be separate from the dirty areas but convenient for access from both the working and washing facilities. Where it is not possible to set aside a separate area, you should organise the work into suitable periods of time to allow employees to take breaks. However, employees should not be allowed to take breaks in dirty areas.

Location for handling the deceased and assessment for infection risk

67 Your risk assessment should consider the most appropriate location for handling the deceased depending on their condition. This minimises the potential for cross-contamination of the area and makes cleaning easier after the handling is complete. You should also consider who is most appropriately qualified or trained to undertake the handling of the deceased depending on their condition and the procedures to be undertaken.

Personal protective equipment

68 Employers have duties concerning the provision and use of PPE at work. This includes selection, provision, training and use of PPE that is appropriate to manage the risks from handling the deceased (eg gloves, eye protection, face masks and, in some instances, respiratory protective equipment (RPE)). When selecting PPE, you should make sure it is CE-marked and that it suits the user in terms of size, fit etc and is appropriate for activities involved in handling the deceased.

69 Your risk assessment for procedures or tasks involving handling the deceased should identify the routes of any likely exposure and the type of PPE to be worn. You must make sure that users of PPE are instructed and trained in its use and that it is maintained, stored and cleaned appropriately and available at all times. PPE should be located close to its point of use and stored in a clean, dry area until required for use.

70 A supply of suitable single-use gloves in various sizes and materials should be readily available. You should consider the potential for workers to become sensitised to latex; select the most appropriate gloves based on a risk assessment and HSE's guidance at www.hse.gov.uk/skin/employ/gloves.htm. Other materials, such as nitrile, are available and latex should be used only if the gloves are low-protein and powder-free. Perforated or split gloves should be changed immediately and you should wash your hands before putting on a new pair.

71 For reusable PPE (eg heavy-duty gloves, visors and aprons) you should specify the arrangements for decontamination during periods of work (eg washing blood or other body fluids from heavy-duty gloves). Further information on cleaning and disinfection is provided in Appendix 3.

72 Dispose of single-use PPE after use in the correct waste stream (eg healthcare or domestic waste) in a dedicated and appropriately labelled container.

73 Where required, provide staff and visitors with appropriate PPE. There should be suitable, separate storage for work and outdoor clothing and adequate space for PPE. Where risk assessment identifies that changing and shower facilities are required (eg staff working in the post-mortem and embalming room), these should be situated so they do not themselves become contaminated. They should be appropriate for the type and scale of work (eg sufficient to accommodate the number and frequency of workers) and designed to prevent the spread of contamination from PPE to personal clothing.

74 Employees should remove any PPE and contaminated clothing when they leave a dirty work area. People should not enter clean areas wearing PPE.

Hand washing

75 Washing hands is an important practice in reducing the transmission of infectious microorganisms. Clean hands with soap and warm water after contact with body fluids, after touching the deceased, and after touching the immediate surroundings of the deceased. To help with hand washing, remove all hand and wrist jewellery. Fingernails should be clean and short, and artificial nails or nail products should not be worn. Cover all cuts or abrasions with a waterproof dressing.

76 Skin care is an important consideration and should involve hands being dried thoroughly after hand washing with disposable paper towels, followed by an emollient hand cream during work and when off duty. For more information on hand washing, see the HSE poster at www.hse.gov.uk/skin/posters/skinwashing.pdf.

Safe management of equipment

77 Equipment is easily contaminated with blood, other body fluids, secretions, excretions and infectious microorganisms. Consequently, you must take care not to transfer infectious microorganisms when using communal equipment for different activities. Certain devices should be used only once and discarded safely (eg certain needles and syringes). Some devices may be used throughout a procedure while others may be communal and shared between individuals and activities. Reusable invasive devices (eg suturing needles) and non-invasive devices (eg transfer trolley) should be appropriately decontaminated between each use; after blood or body fluid contamination; at regular intervals as part of an equipment cleaning protocol; and before any inspection, servicing or repair. Further information on cleaning and disinfection is provided in Appendix 3.

Safe management of blood and body fluid spillages

78 Spillages of blood and other body fluids may present a risk of infection or cross-contamination of areas. Spillages should be decontaminated immediately by staff trained to undertake this safely. Responsibilities for the decontamination of blood and body fluid spillages should be clear and appropriate provisions of cleaning and disinfection equipment and materials made available. Appendix 3 provides further information about cleaning and disinfection.

Occupational safety: prevention and exposure management (including sharps)

79 A significant occupational exposure route is via percutaneous injury (eg injuries from needles, instruments or bone fragments), exposure of broken skin (eg abrasions, cuts or eczema) and/or exposure of mucous membranes including the

eye from splashing of blood or other body fluids. There is a potential risk of transmission of an infectious microorganism from a significant occupational exposure and staff must understand the actions they should take when such an incident takes place (see Appendix 6).

80 *Health and Safety (Sharp Instruments in Healthcare) Regulations 2013: Guidance for employers and employees*⁵ provides further information on the use of sharps with features or mechanisms to prevent or minimise the risk of accidental injury. Although this guidance is aimed at the healthcare sector it provides an effective means of managing the risk of infection from sharps in non-healthcare settings.

Safe management of linen (including uniforms or work clothing)

81 Store clean linen and clothing appropriately in a designated area and in sufficient supply for the scale of work. Dispose of any linen or work clothing that is unfit for reuse (eg badly torn).

82 Categorise any linen (eg sheets or blankets) used for transfer of the deceased at the point of use. For all used linen, provide a laundry container as close as possible to the point of use for immediate deposit. The used linen should not be:

- rinsed, shaken or sorted when removed from trolleys;
- placed on the floor or other surfaces (eg locker or table top);
- rehandled once bagged.

83 Do not overfill laundry containers and do not put inappropriate items in them (eg needles or used equipment).

84 Place all infectious linen or work clothing (ie that has been used for the deceased who are known or suspected to have been infectious and/or that is contaminated with blood and/or other body fluids) directly in a water-soluble or alginate bag and secure it. Then place it in a plastic bag and secure it before placing it in a laundry receptacle. Dispose of items that are heavily soiled and unlikely to be fit for reuse as clinical waste.

85 Store all used and contaminated linen in a designated safe area while awaiting collection or laundering. The storage should be lockable if it is in a publicly accessible area. A suitable frequency for collection or laundering should be in place to avoid a build-up of linen receptacles.

Safe disposal of waste (including sharps)

86 Waste generated from handling the deceased needs to be disposed of safely. Where the waste needs to be transported off-site via public roads, there are specific requirements that need to be met. Guidance on these requirements is available in *Safe management of healthcare waste*.⁸ Although this guidance is aimed at healthcare, the principles are relevant to embalming and funeral services. For hospital post-mortem facilities, these arrangements should also align with the hospital trust's policies on waste disposal.

87 The deceased's clothing is usually passed to the family by hospital or funeral services staff, unless it is soiled. In this case discuss the issue sensitively with the family and if they do not wish it returned, dispose of it as healthcare waste.

88 Classify all waste from the post-mortem and embalming rooms as healthcare waste. Further guidance is available in *Safe management of healthcare waste*. You may dispose of any post-mortem samples that have been retained for histological examination when they are no longer needed, in line with the wishes of the deceased's family. The Human Tissue Authority provides further information on disposal in *Codes of Practice and Standards: Code B: Post-mortem examination*.⁹

Transmission-based precautions

89 Where SICPs are not considered sufficient to manage the risks of infection, usually because the deceased is known or suspected to be infected, additional precautions will be necessary. These are known as transmission-based precautions (TBPs) as the control measures required are selected on the basis of the route of transmission of the infectious microorganism. This can be via one of the following routes:

- airborne;
- droplet; or
- contact (direct or indirect) transmission.

90 Appendix 1 provides further information on the route of transmission for specific infections and microorganisms.

Airborne transmission

91 Airborne transmission is the transmission of infectious airborne particles (aerosols) of small size (less than 5 µm diameter). Particles of this size can remain suspended in the air for long periods of time and may be dispersed over large distances by air currents.

92 Although the risk of generating aerosols is minimal in the deceased, the processes involved in handling the deceased can themselves generate aerosols. In healthcare settings, these are referred to as aerosol-generating procedures. Similar procedures may be involved in post-mortem or embalming. Only certain infectious microorganisms are able to survive in aerosols and are known to be transmissible primarily by the airborne route (eg *Mycobacterium tuberculosis*).

Examples of airborne transmission-based precautions

- Segregate work with the deceased to a dedicated room away from other activities.
- Use of a dedicated bench with a smooth impervious surface fitted with local exhaust ventilation can reduce the risk of infection by inhalation.
- The traditional handsaw can provide a practical alternative to mechanical oscillating saws in certain circumstances and is less likely to generate airborne particles.
- Use of down-draught tables and ventilated visors can help prevent exposure to any infectious airborne particles where the assessment considers this appropriate.
- Use of adequate and suitable respiratory protective equipment (RPE) for post-mortem examinations is required where the assessment identifies a risk of exposure through airborne transmission.
- Placing a cloth or mask over the mouth of the deceased when moving them can help to prevent release of aerosols.

Droplet transmission

93 Droplet transmission is the transmission of droplets (5 µm to approximately 200 µm diameter) from the deceased to a susceptible mucosal surface or conjunctiva (eg eyes, nose or mouth) of another individual. Droplets of less than 20 µm can remain suspended in the air for many minutes, while droplets of more than 20 µm fall out of suspension in seconds. Droplets do not readily penetrate the lower respiratory system. The maximum distance for cross-transmission from droplets has not been definitively determined, although a distance of approximately

1 metre around the infected individual has frequently been reported in the medical literature as the area of risk.

94 Droplets can be produced from the respiratory tract while moving or opening the body, and by procedures that cause splashing or spraying of body fluids. Examples of infectious agents transmissible by the droplet route include influenza virus and bacteria such as *Corynebacterium diphtheriae* and *Neisseria meningitidis*.

Examples of droplet transmission-based precautions

- Avoid activities likely to cause splashing, such as washing down with high-pressure hoses, cleaning instruments under running water, and squeezing organs that have been removed from the body.
- Wear appropriate PPE that provides a physical barrier to droplets (eg surgical mask with eye protection, face visor).
- Use a dedicated area to avoid significant environmental contamination.

Contact transmission

95 Contact transmission is the most common route of transmission and consists of two types: direct and indirect.

96 Direct contact transmission occurs when microorganisms are transmitted directly from an infectious body to another individual without the involvement of another contaminated person or object (fomite). Direct contact transmission can occur, for example, when blood or other body fluids from an infectious body directly enter another individual's body through contact with a mucous membrane or via cuts and abrasions to the skin.

97 Indirect contact transmission occurs when microorganisms are transmitted from an infectious body to another individual through a contaminated object (fomite) or person. Indirect contact transmission can occur, for example, via a worker's hands if they do not perform hand hygiene between touching an infectious body or object and touching another individual; via communal equipment contaminated with blood and/or body fluids that has not been adequately cleaned or disinfected between use; and via surgical instruments or equipment that have not been adequately sterilised or disinfected between use.

98 Microorganisms transmitted primarily by the contact route (both direct and indirect) include blood-borne viruses and enteric bacteria.

Examples of contact transmission-based precautions

- Enclose the deceased in a leak-proof body bag if known or likely to leak body fluids.
- Use additional PPE such as double gloving (eg covering an inner surgeon-style glove with a thicker outer glove which extends beyond the cuff of the gown).
- Wear heavy-duty gloves of elbow and shoulder length (if needed) and waterproof sleeve covers, where significant contamination is likely.
- Use a set of dedicated instruments for known, suspected infection cases to minimise the frequency of their use and the risk of transmitting infection.
- Use single-use instruments wherever possible for Creutzfeldt-Jakob disease (CJD) cases.
- Enclose the deceased's head within a large plastic bag during use of a bonesaw for post-mortem examination of CJD cases.

Collection, transport and transfer of information related to the deceased

99 This section is aimed at those involved in the collection and transportation of the deceased, such as funeral service or ambulance staff. It explains the precautions to implement at this stage in the process to control the risk of infection. The collection and transportation may be from the community (eg a home or other premises) or from the mortuary.

100 A key component of this section is the importance of transferring appropriate information from different parties about known or suspected risks of infection from the deceased.

Initial collection of the deceased and appropriate transfer of information

101 Before collection of the deceased from the community or from a NHS or public mortuary, you should find out as much information as possible about the condition of the deceased and any potential infection risks.

102 When collecting a body from the community, the coroner, the doctor certifying the death or the medical examiner is best placed to provide this information. This information is essential to make sure the collection is adequately planned, co-ordinated and executed. This includes application or availability of any appropriate equipment (eg body bags) or control measures (eg PPE) that may be identified as being required.

Hazard notification sheet

103 To help with the exchange of appropriate and sufficient information, Appendix 2 provides a template for the type of information that should be provided with the deceased – this is known as the hazard notification sheet.

104 The hazard notification sheet is one way of providing those who will handle the deceased with the necessary information to do so safely. It is intended to highlight hazards associated with the deceased, which can include infection risk, implantable devices and radioactive sources. As the information is of a personal nature, it should be handled sensitively and shared only with those who need it to carry out an appropriate risk assessment and to enable appropriate precautions to be taken.

105 In some cases, the deceased may have requested that information relating to their health remains confidential. The General Medical Council provides information about the duty of confidentiality, which continues after a patient's death, in its general medical practice guidance *Confidentiality: Good practice in handling patient information*.¹⁰ Whether and what personal information may be disclosed after a patient's death will depend on the circumstances. Where there is a known or suspected risk of infection, sufficient information must be provided to enable people handling the deceased to supplement the SICPs with appropriate additional precautions to minimise exposure. Although it is helpful to provide the specific details of the infectious agent, it is not essential. However, you should provide

details of the likely routes of transmission (eg airborne, droplet and/or contact) along with any other information relevant to the safety of those handling the deceased.

106 You should use the hazard notification sheet to provide any relevant information (including condition of the deceased) to help those handling the deceased to decide whether and how to handle them during viewing, preparing (hygienic preparation), embalming, post-mortem examination or exhumation. For example, indicating whether a body bag is necessary (and why), the presence and location of any sharp medical devices or implantable devices (eg pacemakers), and details of any counter-indications that may prevent specific activities (eg embalming) being performed.

107 In hospital cases, the doctor and/or nursing staff with knowledge of the deceased's condition is asked to sign the hazard notification sheet. Where a post-mortem examination has been undertaken, the pathologist (or qualified APT) is asked to sign. The form should be updated by the APT in the light of any further relevant information made available during the examination. In non-hospital situations (eg community settings), the doctor with knowledge of the deceased's condition is asked to sign.

108 When provided with relevant information, you should make sure that it is passed on, in an appropriate form (eg what control measures to apply), to others who need to handle the deceased, such as employees, non-employees such as embalmers, and in some cases, families or friends.

Notification of reportable diseases

109 Certain diseases are reportable to public health bodies in England, Scotland and Wales under national legislation. Please refer to the relevant legislation in Appendix 1 for notifiable diseases.

Implantable medical devices

110 Implanted electronic devices (eg permanent pacemakers, implantable cardioverter defibrillators, intrathecal pumps and neurostimulators) can be present in the deceased. Information should be provided by the deceased's GP, hospital or family or included in the hazard notification sheet as to whether an implantable device is present, where it is located and whether it requires to be or has been deactivated.

111 Implantable cardioverter defibrillators present a risk of electric shock to those performing post-mortem examinations and embalming. This is likely to be very uncomfortable although it is unlikely to be harmful. Deactivate these devices if there is a need to perform a post-mortem examination or to remove them.

112 Where the intention is to cremate the deceased, the implantable devices have the potential to explode when heated. Consequently, the devices should be removed before cremation. It is the responsibility of the person arranging the cremation to also arrange for the device to be removed. This can be done in the hospital mortuary by the APT or at the funeral premises.

113 Following the removal of any implantable devices, arrangements should be in place to dispose of them safely. This requires written consent from the family of the deceased (where this can be obtained) as the device belongs to the deceased and is therefore part of their 'estate'. Return these devices to the local hospital or mortuary, where possible, for decontamination and return to the manufacturer for final disposal. Do not mail them or dispose of them as waste. Guidance on safe removal of implantable devices is available from the Medicines and Healthcare Products Regulatory Agency.¹¹

Safe working practices

114 When transporting the deceased (eg from a mortuary to the funeral premises or from the collection point to a mortuary) with a known infection risk, or where there is significant leakage of body fluids, a body bag will minimise the potential for exposure of workers and contamination of the vehicle. Some hospitals use body bags for all the deceased as standard practice to minimise leakage of body fluids. However, the use of body bags can increase the potential for incubating bacteria and accelerate decomposition. Therefore, provided there is no notifiable disease present and no leakage expected, a body bag is not normally required. If the body bag has been used to control the risks of infection, you should indicate this on a completed hazard notification sheet which will provide information on why the bag has been used.

115 Similarly, if the deceased collected from the community has undergone significant deterioration, a body bag should be used. It may be necessary to use additional waterproof containers.

Standard infection control precautions for funeral service staff and other staff during delivery or removal of the deceased to and from the mortuary

- Never smoke, eat, chew, drink or do anything else that will bring your hands into contact with your mouth, eyes or nose.
- Make sure that any cuts or abrasions, particularly on your hands, are covered by a waterproof dressing. If there is any doubt about the effectiveness of the cover, obtain medical advice.
- Make sure single-use protective gloves and aprons are readily available and employees are trained as to when to wear and remove them.
- Make sure freshly prepared disinfectant solution, swabs and cloths are available and used.

Presentation of the deceased

116 Presentation of the deceased by mortuary staff should make sure that risks to funeral service staff are minimised. If necessary, the body can be placed in a body bag to prevent leakage of body fluids. If a post-mortem examination has taken place, the Association of Anatomical Pathology Technology (AAPT) has developed post-mortem standards¹² for APTs to make sure that the deceased is suitable for viewing and to minimise the infection risk following post-mortem examination.

117 After delivering or collecting a body, funeral staff and ambulance staff should:

- remove any protective clothing and dispose of it safely;
- thoroughly wash their hands before leaving the mortuary.

Intravenous lines, drains, indwelling catheters etc

118 Intravenous lines, such as cannulas, as well as drains and indwelling catheters, may be present in the deceased. Although they can present a risk to people handling the deceased, their removal can result in leakage of body fluids from the puncture site. There are usually local policies for dealing with this between mortuaries and funeral directors for non-post-mortem cases.

119 Mortuary staff should discuss with the funeral director their ability to remove intravenous lines, drains, indwelling catheters etc. If they are unable to remove these then the APT should attend to this before releasing the deceased. If there is a risk of leakage of body fluids from removal, then lines may have been left *in situ*,

although these should be clamped and cut close to the skin. The hazard notification sheet should indicate if and where these have been left *in situ*.

120 Seek advice on disposal of any residual medication in devices left in place. When a family member collects the deceased, all lines should be removed unless there is a risk of leakage which may cause more distress. When release to a funeral director is prompt to ensure same-day burial, the funeral director should make sure that all lines are removed and disposed of safely in case family members wish to bathe or dress the deceased. See the Hospice UK guidance *Care after death: Guidance for staff responsible for care after death*.¹³

Repatriation or expatriation of the deceased

121 With regard to the control of infection, the movement of the deceased, either those being transported abroad or those being received from abroad, is governed by a number of authorities. These include:

- the authority of the receiving country (normally the body of law that controls how the deceased should be handled);
- that of the country of origin;
- the carrier (whose requirements will be governed by the International Air Transport Association Restricted Articles Regulations).

122 For any movement, the deceased must be accompanied by a 'free from infection' certificate written by medical staff to confirm, to the best of their knowledge, that there is no infection risk to those handling the body. If the deceased has been embalmed before transfer to prevent decomposition during transport, a certificate of embalming is also required.

Managing the risks of infection in the post-mortem room and mortuary

123 This section is aimed at pathologists, APTs and others working in the mortuary and post-mortem room. It outlines the requirements for a suitable facility, the process of post-mortem examination, the risks that should be considered and the safe working practices to control those risks. It is important to retain links with the occupational health, infection control and estates departments.

Facility design

124 Guidance on the design and construction of new and upgraded mortuaries and post-mortem rooms is provided in *Facilities for mortuary and post-mortem room services*¹⁴ for England and Wales, and in *Mortuary and post mortem facilities: Design and briefing guidance*¹⁵ for Scotland.

125 The minimum requirements for general workplace conditions such as lighting, ventilation, floor surfaces and temperature are set out in the *Workplace (Health, Safety and Welfare) Regulations 1992 Approved Code of Practice*.¹⁶ The following paragraphs summarise some of the factors that you should consider in the facility design.

126 The size of the mortuary (including the body store and post-mortem room) should be based on the maximum anticipated storage requirements for bodies and post-mortem examination requests.

127 Floor surfaces should be suitable for the work carried out. They need to be constructed from hard-wearing, easily cleanable materials with impervious surfaces that are resistant to damage by chemical action, including disinfectants. They should not be slippery or uneven. Coved edges to floors make cleaning easier, and sloping towards drains and gullies helps drainage.

128 Similarly, all fittings and furniture, particularly post-mortem tables, dissecting surfaces and walls, should be constructed from hard-wearing, easily cleanable materials with impervious surfaces that are resistant to chemical damage.

129 Where the deceased is known or suspected to present an increased risk of infection (those infections listed in Appendix 1), your risk assessment should determine whether a separate area is required. However, if such facilities are not available, it is still possible to control risk adequately, providing properly trained staff adopt appropriate TBPs and the mortuary facilities are suitable for such work.

130 Hands-free communication devices and wipe-clean, covered keyboards or tablets are recommended to avoid contamination. Equipment designed for use when the hands are contaminated is best activated by voice, elbow or foot.

Ventilation

131 You should make sure that there is adequate fresh airflow throughout the mortuary and post-mortem room. The design requirements of the mortuary and post-mortem room specify the importance of odour control. Specimen storage

facilities will also require adequate ventilation, which may include purpose-designed local extraction to control odour from preserved samples or from body and specimen storage.

132 Airflow from ventilation systems is best directed away from observers, preferably by drawing air into the mortuary at a high level and discharging it at a low level. Down-draught tables are a good way of minimising the risk of infection by direction of airflow. However, their effectiveness depends on their design and whether there is an efficient extraction point at floor level. COSHH requires local exhaust ventilation systems to be thoroughly examined every 14 months by a competent person.

Observation areas within the post-mortem room

133 Observation areas should be sited within a clean area of the mortuary, separate from the post-mortem room. Direct access to this area should be from a clean part of the mortuary.

Viewing facilities for friends and families

134 Suitable waiting areas, including toilet facilities, and a viewing room for families or friends wishing to view the deceased should be provided. Visitors should not be able to enter any dirty or transitional areas of the mortuary when using or accessing these rooms.

Body reception at the mortuary

135 Arrangements should be set out for preparing the deceased before they are delivered to the reception area in the mortuary, including:

- adequate identification of bodies;
- covering bodies and containing leakage of body fluids from all external orifices and wounds (eg sheets or well labelled body bags, depending on likelihood of leakage).

136 It may be necessary to use multiple body bags for the deceased where the body is badly decomposed or traumatised. Appendix 1 provides information about multiple body bagging for the deceased who present an increased risk of infection.

137 By following safe working practices, APTs should make sure they are informed of all infection risks when the body is delivered to the mortuary. This information may also be provided in advance using the hazard notification sheet (Appendix 2).

Body and specimen storage

138 Body storage capacity needs to be adequate to cope with public holiday periods or any other situation causing a temporary increase in body numbers. There should be contingency arrangements in place to transfer bodies to other suitable premises should storage capacity become a problem.

139 The body store should provide direct access to the post-mortem room. One way of achieving this is to have double-ended, refrigerated storage compartments between it and the post-mortem room. Storage compartments should be designed to be easily cleaned and maintained, and size should be considered to accommodate paediatric and bariatric bodies.

140 Before a post-mortem examination is performed, bodies are normally stored in cabinets at a reduced temperature (approximately 4°C) and should be returned

there pending removal for burial or cremation. Carry out regular temperature checks of cold storage facilities to confirm that refrigeration units are working effectively. Alternatively, sensors with alarms can be used to alert you when the temperature of cold storage exceeds pre-set limits. Bodies not for examination should be stored in a similar way. Long-term storage of bodies should be in a deep-freeze compartment. If specimens are kept for any period of time and any hazardous chemicals are used for preservation, the area must be adequately ventilated to control exposure.

Safe working practices in the mortuary and post-mortem room

141 You must make sure that mortuary staff are fully aware of the risk of infection associated with a body. Get information from the clinical team that was responsible for the patient or, where cases are brought to the mortuary from the community, from coroner's officers, procurators fiscal or general practitioners.

142 You must make sure that safe working practices are in place and being followed by staff in mortuaries and post-mortem rooms. Pathologists and APTs should assess risk before commencing any post-mortem examination. This includes:

- being aware of known or suspected infection hazards (eg from the hazard notification sheet) and the need for TBPs;
- timing of post-mortems (eg the importance of taking sufficient time for each case, as hurried procedures increase the likelihood of accidents) and temporal separation (eg dealing with the deceased who present an increased risk of infection last to reduce the likelihood of contamination);
- where several bodies are being worked on consecutively in the post-mortem room, the systems in place to avoid cross-contamination;
- the number of staff required and whether visitors or observers should be excluded.

143 A high level of vigilance should ensure that adequate control is maintained at all times during post-mortem examinations. Should a situation arise (eg the discovery of tuberculosis lesions), TBPs should be implemented immediately.

144 The mortuary manager may need to authorise staff who do not normally work in the mortuary, such as porters and nurses, to enter the body storage area outside normal working hours (for example, they may need to place bodies in refrigerated storage). Such staff need proper instruction from competent mortuary staff in the safe working practices that are appropriate to the tasks they are undertaking. This will include the use and disposal of appropriate PPE (see paragraphs 59–98).

Access to post-mortems

145 You should make sure that the numbers of people present in the post-mortem room are kept to a minimum, but at least two people should be present during an examination: usually the pathologist and an APT. By organising workflow and controlling access to the mortuary and post-mortem room, unnecessary movements which might interfere with infection control procedures and increase the risk of accidents can be minimised.

146 Unauthorised people should not enter the mortuary. All visitors should be supervised by a member of the mortuary staff and where necessary given appropriate PPE to wear. Appropriate precautions to mitigate the risk of cross-contamination are explained in paragraphs 59–98.

147 Where the post-mortem examination is being carried out for training and educational purposes, appropriate precautions should apply to all people involved. However, post-mortem examinations on the deceased who present an increased risk of infection should not be allowed for training and education purposes.

Personal protective equipment

148 Everyone present during a post-mortem examination should enter the room via the changing facilities, where they should put on the PPE specified in the safe working practices as instructed by post-mortem staff.

Standard infection control precautions include making sure the following items are worn by pathologists and APTs during all post-mortems:

- a surgical scrub suit;
- an impermeable or fluid-resistant single-use gown that completely covers the arms, chest and legs;
- a plastic single-use apron to cover chest, trunk and legs;
- waterproof boots;
- single-use gloves.

Transmission-based precautions may include wearing the following additional PPE during post-mortems for deceased with a higher infection risk:

- a form of eye protection or plain unventilated visor to provide a physical barrier to droplets;
- a face mask to protect the mouth and nose from direct splash contamination if a visor is not worn;
- cut-resistant protective gloves, where appropriate to the activity.

149 Additional protection may be provided by double gloving; for example, covering a single-use glove with a thicker outer glove which extends beyond the cuff of the gown. Safe working practices should set out the requirements according to risk.

150 When using extremely sharp tools, including power cutting tools that can incise bone and cartilage, thicker sharps-protective gloves (eg made of metal mesh) may be worn on the non-dominant hand on top of single-use gloves. If these are reusable, you should specify the arrangements for decontamination. Further information on cleaning and disinfection is provided in Appendix 3.

151 Anyone entering a dirty area should wear a gown, gloves, waterproof boots, a plastic apron and a visor, even if they are not actively engaged in the work. You should restrict entry to dirty areas when post-mortem work is ongoing.

152 The PPE worn in the designated clean/dirty areas in the mortuary (such as the body store), and also the post-mortem room after it has been decontaminated, need not be the same as that required during post-mortem examination. Safe working practices should clearly specify what is required, and anyone entering such areas should comply with these requirements.

Equipment and instruments

153 The requirements for equipment and instruments for post-mortem examinations should be decided locally, taking account of the projected workload. Instruments should be kept sharp, clean and ready for use. Although there is no

legal requirement on this, it is recommended that three sets of instruments should be made available. This allows one set to be in use, a second ready for use and a third being cleaned, disinfected and autoclaved as necessary.

154 For CJD cases you should use single-use instruments wherever possible, and incinerate them after use. Where this is not feasible, a set of dedicated instruments for known, suspected or at-risk cases is recommended to minimise the frequency of their use and the risk of transmitting infection to staff. Further detail can be found in the Advisory Committee on Dangerous Pathogens' Transmissible Spongiform Encephalopathy (ACDP TSE) Subgroup guidance, *Minimise transmission risk of CJD and vCJD in healthcare settings*.¹⁷

Safe use of sharps

155 The use of safer sharps (ie with features or mechanisms to prevent or minimise the risk of accidental injury) is required in the healthcare sector; this is one way of managing the risk of sharps injuries. Where this is not feasible, you should implement procedures for the safe use and disposal of sharps (eg prevent the recapping of needles and dispose of sharps in secure containers close to the work area).

Post-mortem examination

156 Before a post-mortem examination, staff should prepare the post-mortem room and equip it in accordance with the safe working practices. Related information is given in the information box below.

Before a post-mortem examination begins, APTs should make sure that:

- an adequate supply of PPE is available;
- heavy-duty gloves and aprons are readily available, if required;
- air supply and extraction systems are working properly;
- drains are clear and have been cleaned and disinfected and the water supply is working;
- there is an adequate supply of soap, freshly prepared disinfectants, detergent solutions and specimen containers;
- tools and equipment required during post-mortem examination are properly maintained, clean and ready for use, and are set out as required at examination tables and dissecting benches.

157 To minimise the risk of transmission of infectious agents during a post-mortem examination you should make sure that the techniques used will minimise liquid dispersion and splashing and that all instruments likely to cause puncture wounds or cuts are handled appropriately to avoid sharps injury.

158 A post-mortem examination should be undertaken only when adequate controls are in place (as identified by the risk assessment) to prevent or minimise any risk of infection. Some activity-specific precautions are given in the following information box.

Standard infection control precautions for post-mortem examination

- Never pass instruments from hand to hand during a post-mortem examination.
- Once used instruments are no longer required, set them aside for decontamination.
- Never attempt to catch a falling instrument. To help prevent accidental falls, do not lay instruments down indiscriminately after use.
- Wherever possible, minimise operations likely to cause splashing or generate aerosols, such as washing down with high-pressure hoses, cleaning instruments under running water and squeezing organs that have been removed from the body.
- If a sluice is included in the room, make sure it is fitted with a suitable cover to prevent fluids being aerosolised when it is flushed.
- Wear a visor. All cutting operations, particularly sawing, can produce particles and splashing. Visors provide a physical barrier, prevent staff from touching their faces and enable spectacles to be worn.
- Make sure that oscillating saws are fitted with an air extraction hood.
- Follow specified cleaning and disinfection procedures for decontamination of work, floor and wall surfaces and of equipment, including PPE where appropriate.

159 Dissection and fixation of the organs after evisceration may be carried out on a suitable non-slip surface at the post-mortem examination table. However, a dedicated bench with a smooth, impervious surface fitted with local exhaust ventilation is required where there may be a risk of infection by inhalation. This will also help control exposure to other hazardous substances, such as formalin fixative vapour.

160 During dissection of the body, you should make sure that the number of sharp instruments present on the post-mortem table is kept to a minimum. Use blunt-ended scissors and scalpel blades, or suitable alternatives, whenever possible.

161 If blood or body fluids are aspirated by needle and syringe, the needle should not be removed or resheathed after use. Used needles and syringes should be disposed of safely immediately after use in a sharps container, which should be positioned close to the areas where medical sharps are used. The needle must not be recapped. Do not change scalpel blades by removal from the handle during the post-mortem examination; lay out an adequate supply of new, mounted blades before the start.

162 Take particular care when carrying out cutting and sawing procedures on bone and cartilage tissues, including opening the skull for removal of the brain. Mechanical oscillating saws can produce droplets and cause splashing and it is important to make sure that the particle captor hoods are properly fitted during use. The traditional handsaw can also provide a practical alternative in certain circumstances and is less likely to generate any airborne particles. However, accidental injury to the operator's non-cutting hand may be more likely and the wearing of cut-resistant gloves is recommended.

163 Safe working practices should ensure that all work with bodies, organs and unfixed specimens is only carried out in dirty areas. When transporting specimens outside the post-mortem room, staff must make sure that they are placed in suitable containers with clean outer surfaces. Secondary containment in a robust lidded carrier will also be appropriate when transferring specimens to other areas such as the pathology laboratories, and local infection policies will provide further detail.

Post-mortem examinations that present an increased risk of infection

164 Where bodies are not properly identified or people have died in suspicious circumstances, and particularly where there is no satisfactory medical record, you should:

- label and treat such bodies as increased-risk cases, unless additional information becomes available;
- enclose all bodies labelled as increased-risk in a leak-proof body bag where the risk assessment deems this necessary.

165 The deceased that are known to present an increased infection risk should be examined using TBPs in addition to SICPs. The options include the use of down-draught tables and ventilated visors to help prevent exposure to any infectious airborne particles where the assessment considers this appropriate. If safe conditions for the examination cannot be met, transfer the bodies to a more appropriate facility.

166 All staff working in the post-mortem room during such examinations will need adequate training in mortuary procedures and safety precautions for such cases.

167 Remove single-use PPE immediately and dispose of it as clinical waste; if it is reusable decontaminate it in accordance with local infection control policies.

Respiratory protective equipment

168 You should use adequate and suitable respiratory protective equipment (RPE) for post-mortem examinations where your assessment identifies a risk of exposure through airborne transmission. RPE should always be fitted with the highest-efficiency filter possible (FFP3) to control exposure of microorganisms down to the lowest levels. Due to the length of time the task can take, those carrying out post-mortem examinations on the deceased infected with tuberculosis might find a powered hood-type respirator is most suitable, in addition to using general extraction in the room to control exposure.

169 Tight-fitting face pieces should be face-fit tested to the individual wearing it. They should also be given appropriate training on the safe use of the equipment. RPE should be stored and maintained in accordance with its use. *Respiratory protective equipment at work: A practical guide*¹⁸ provides further information.

Safe working practices

170 For the deceased known to present an increased risk of infection, keep the number of people engaged on the examination of a body to a minimum. They usually include:

- the pathologist;
- an APT (or another pathologist);
- a circulator, who will be another member of the pathology staff (often a trainee or student); they will undertake tasks ancillary to the post-mortem, thereby limiting the spread of contaminated material.

171 The pathologist and assistant should ideally not work without the circulator. Circulators should, as far as possible, keep away from the actual procedures at the post-mortem examination table. If their PPE becomes soiled they should change it immediately. Their duties may include:

- communication, recording and observation;
- providing clean instruments and replacement protective equipment;
- arranging for removal of specimens for laboratory tests;
- photography.

172 When instruments are required by the pathologist or APT, the circulator should place them on a side table from where they can be picked up. This practice is advised for all examination procedures. The circulator should also keep a constant look-out for any risks associated with the presence and use of sharp tools, instruments, spillage and splashing.

173 The pathologist is always responsible for the safety of procedures in opening, removing organs from and examining the body, but they may authorise a suitably trained APT to help with this work. The APT should not handle sharp instruments or tools unless specifically instructed to do so by the pathologist. The pathologist and the APT should not handle sharp tools and instruments at the same time.

174 Everyone in the post-mortem room should obey warnings from any member of the examination team and stop work until the matter has been resolved.

175 At the end of the examination, one of the team, usually the APT, should make sure that all PPE worn during the examination is disposed of correctly or treated according to local infection rules, where appropriate.

176 Presentation of the deceased by mortuary staff should minimise any risks to funeral service staff. This may involve making sure that the internal organs are bagged and placed inside the body cavity. Close all incisions made during the examination to prevent leakage of body fluids. If necessary, place the body in a body bag to prevent leakage of body fluids. When body bags are used, wadding may be needed around the body where leakage is likely to occur. Whenever the brain has been removed and not replaced, the cranial cavity should be packed with wadding. Do not secure any clinical or other waste arising from the post-mortem to or within the body but dispose of it safely. Dispose of post-mortem sharps safely before collection and transportation of the body by funeral service staff.

Post-mortems on the deceased with hazard group 4 microorganisms

177 You should not carry out post-mortem examinations on the deceased with a known hazard group 4 microorganism, eg viral haemorrhagic fever virus (see Appendix 1). If a post-mortem is deemed essential for clinical or medicolegal reasons, it should be referred to a specialist centre where specific protocols have been developed. The guidance document from the Advisory Committee on Dangerous Pathogens (ACDP), *Management of Hazard Group 4 viral haemorrhagic fevers and similar human infectious diseases of high consequence*,¹⁹ provides further information about work with hazard group 4 microorganisms.

Post-mortems on the deceased with CJD

178 In cases of CJD, carry out the post-mortem examination in such a way as to minimise contamination of the working environment. It is recommended to enclose the entire head within a large plastic bag during use of a bone saw. The bag is fitted over the head and neck of the deceased and the saw is introduced through a hole in the bag, which may then be sealed by tape as necessary. It is also recommended that the examination be carried out with the body inside an open body bag with absorbent wadding alongside the body, but within the bag, to collect the body fluids.

179 At the end of the post-mortem examination, remove soiled wadding and, if necessary, apply clean wadding. The body should be reconstructed in line with relevant standards and presented in a clean body bag. Incinerate any soiled wadding. The Advisory Committee on Dangerous Pathogens' Transmissible Spongiform Encephalopathy (ACDP TSE) Subgroup guidance (*Annex H After death*)²⁰ provides further detail on appropriate precautions. Advice is also available from the National CJD Research and Surveillance Unit in Edinburgh.

180 Where CJD is not diagnosed until after a post-mortem examination has taken place, you should follow procedures for decontamination laid out in the ACDP guidance on transmissible spongiform encephalopathy.

Specimen transport

181 For mortuaries and post-mortem facilities located within hospitals, the specimen collection, packaging and transport arrangements should be compatible with the policy of that hospital.

182 Place tissue specimens for histopathological examination in appropriately sized containers which allow them to be totally immersed in fixative solution. Staff should decontaminate the outside of the containers, in accordance with safe working practices, before sending them to the pathology laboratory.

183 All specimens sent to laboratories should be suitably packaged within robust, sealable carriers to minimise the risk of leakage and labelled to make clear the nature of the contents. Further guidance on specimen transport is available in *Management, design and operation of microbiological containment laboratories*.²¹

Visitors and observers in the mortuary and post-mortem examination room

184 Your risk assessment should identify groups of people who may be at risk, specify the nature of the risk and how this might change (eg between entering the post-mortem examination room while it is operative and when it is clean) and how to control the risks to them.

185 Visitors to the mortuary may be from other parts of the premises or from outside. They should not normally be admitted to the post-mortem room while it is in operation except for training and education or for an inspection by a regulatory agency. A suitably qualified APT should supervise them at all times.

186 Sometimes workers such as maintenance personnel will need access to the post-mortem room. They should be allowed to enter only under a permit-to-work or equivalent system, and should be excluded until the suite has been cleaned.

Arrangements for viewing by families and others

187 Next of kin and representatives of religious orders may wish to see the deceased, either before or after the post-mortem examination. If any visitors have had physical contact with the deceased, encourage them to wash their hands thoroughly before leaving the mortuary. The Association of Anatomical Pathology Technology (AAPT) has developed post-mortem standards¹² for APTs to make sure the deceased is suitable for viewing and to minimise the infection risk following post-mortem examination.

188 Mortuary staff should advise visitors if there could be a health risk from touching or kissing the body. If these risks are significant, discourage families from

doing so and explain about the risks. This should be done tactfully and ideally by a trained member of staff.

189 Viewing of the deceased with infection from the most hazardous microorganisms is not permitted in the mortuary (see Appendix 1 for details).

190 When, for religious purposes, there is a requirement to wash a body that may present a risk of infection, those concerned should be clearly informed of the nature of any risk and advised on the precautions to take, eg the use of suitable PPE. If a suitable area is provided for this purpose, it should be separate from the clinical areas of the mortuary where work is being carried out.

191 If families ask whether a patient died from an infectious disease, they should be referred to the relevant medical practitioner. Family members or friends who are worried about having been exposed to any microorganisms should be referred to an appropriate clinician.

Porters, domestic or cleaning staff and service or maintenance staff

192 Your safe working practices and training procedures should specify the precautions needed to prevent exposure to infectious materials for porters, domestic or cleaning staff and service or maintenance staff who may be unaware of the risks they may encounter. These should include:

- co-operating with other employers concerned, and co-ordinating the work to make sure that they have sufficient information about SICPs; the PPE to be worn; when and where they are allowed to work and under what conditions;
- procedures for handing over particular areas of the mortuary (eg following decontamination and cleaning procedures and the use of permit-to-work procedures);
- supervision by APTs (eg authorising access, checking that they are following the safe working practices for the mortuary);
- refresher training where necessary.

Managing the risks of infection in funeral premises

193 This section is aimed at funeral directors and their employees, including embalmers, working in funeral premises. It outlines the features that make a facility suitable for the process of performing hygienic preparations and embalming, the risks to consider and the safe working practices to control those risks.

Facility design

194 Funeral service facilities should provide accommodation that enables staff to work safely. It is recognised that the facilities are varied and different from those found in the healthcare setting.

195 Minimum requirements for general workplace conditions such as lighting, ventilation, floor surfaces and temperature are set out in the *Workplace (Health, Safety and Welfare) Regulations 1992 Approved Code of Practice*.¹⁶

196 The size of the facility (including the body store and embalming room, where required) should be based on the storage requirements for bodies and the embalming anticipated to take place.

197 Floor surfaces should be constructed from hard-wearing, easily cleanable materials with impervious surfaces that are resistant to damage by chemical action, including disinfectants. They should not be slippery or uneven. Coved edges to floors make cleaning easier, and sloping towards drains and gullies helps drainage.

198 Similarly, all fittings and furniture, particularly embalming tables, should be constructed from hard-wearing, easily cleanable materials with impervious surfaces that are resistant to chemical damage.

199 You should use a separate area for embalming where possible (sometimes referred to as an embalming theatre). If the room is also used for hygienic treatment, then in cases where the deceased is known to present an increased risk of infection, you should not allow embalming to take place at the same time as other activities being carried out on another body. However, you may do so if an appropriate risk assessment has been conducted and necessary precautions have been applied by all those working in the area.

200 Hands-free communication devices and wipe-clean, covered keyboards or tablets are recommended to avoid contamination. Equipment designed for use when the hands are contaminated is best activated by voice, elbow or foot.

Ventilation

201 You should make sure that there is an adequate fresh airflow throughout the workplace for odour control. In many cases, windows or other openings will provide sufficient ventilation in some or all parts of the workplace. Where necessary you should provide mechanical ventilation systems. Whatever the means of providing fresh air (natural or mechanical), you should make sure that measures are taken to control the entry of pests such as flies and rodents.

202 In areas where embalming is carried out, local exhaust ventilation will be required to control levels of exposure to embalming fluid. The need for personal and workplace monitoring should also be considered in the assessment. COSHH requires local exhaust ventilation systems to be thoroughly examined every 14 months by a competent person.

Body reception at funeral premises

203 Your safe working practices should ensure that funeral service staff are informed of all cases where an infection risk is known or thought to exist before the body is delivered to the funeral premises. This information should be provided using the hazard notification sheet (Appendix 2). The AAPT has developed post-mortem standards¹² to ensure that, following post-mortem, the deceased is prepared in a manner that is suitable for viewing and minimises the infection risk to others (including funeral services staff) who may then handle them.

204 The information provided should enable staff to assess the likelihood of infection from the deceased, make any special arrangements required and, where necessary, seek advice. Where there is a known or suspected risk of infection, additional labelling indicating the nature of the risk is needed. This may be done by indicating the potential route of transmission (airborne, droplet or contact) of any infectious microorganisms. Where this information is not provided, you should try to get it from your local healthcare practice where possible.

Body storage

205 Body storage capacity needs to be adequate to cope with public holiday periods and any other need for temporary increase in body numbers. You should have contingency arrangements in place to transfer bodies to other suitable premises should storage capacity become a problem.

206 Storage compartments should be designed to be easily cleaned and maintained, and size should be considered to accommodate bariatric and paediatric bodies.

207 Minimise the handling of the deceased to control the risk of exposure. Keeping the deceased cool controls further deterioration by limiting further growth of any bacteria present (see the information box). You should try to minimise the number of times the deceased are removed from cold storage, eg by implementing controlled viewing times where possible.

208 If bodies are to be held for less than 48 hours, storage at 6°C or below is appropriate. If you need longer-term storage, this should be at temperatures of approximately 4°C. Carry out regular temperature checks of cold storage facilities to confirm that refrigeration units are working effectively, or use sensors with alarms to alert you when the temperature of cold storage exceeds pre-set limits.

Storage of the deceased before burial or cremation

Keeping the body cold limits the rate of decomposition by slowing the growth of bacteria that contribute to the decomposition process. Certain drugs (administered before death) may also influence the rate of decomposition.

Ideally, a refrigerated body store should be used for this purpose, but this may not be practicable in smaller premises where only a limited number of bodies are handled. However, there are a number of other means by which cooling could be achieved; for example:

- using cold tables or cool blankets;
- installing air chillers;
- using facilities at larger premises (if the site is a satellite premises);
- making arrangements with local hospitals to delay collection, where possible.

Safe working practices in funeral premises

209 You must make sure that safe working practices are in place and being followed. Assess the risks before starting hygienic preparations or embalming. Your risk assessment should consider:

- known or suspected infection hazards (eg from the hazard notification sheet) and whether there is a need for TBPs;
- timing of procedures (eg the importance of taking sufficient time for each case as hurried procedures can increase the likelihood of accidents) and temporal separation (eg dealing with increased infection risk cases last to reduce the likelihood of contamination);
- the number of staff required and whether to exclude visitors or observers.

210 Be highly vigilant to make sure that adequate control is maintained at all times during hygienic preparations and embalming.

Access to hygienic preparations and embalming

211 You should make sure that the numbers of people present when carrying out hygienic preparations or embalming are kept to a minimum. By organising workflow and controlling access to the areas where hygienic preparations or embalming are carried out, you can minimise any unnecessary movements, distractions or interruptions which might interfere with safe working procedures or increase the risk of accidents.

212 Unauthorised people should not enter areas where hygienic preparations or embalming are carried out. A member of the funeral service staff should supervise all visitors and where necessary give them appropriate PPE to wear. Additional precautions to mitigate the risk of cross-contamination are explained in paragraphs 59–98.

213 Where hygienic preparations or embalming is being carried out for training and educational purposes, the appropriate precautions should be applied to everyone involved. However, you should not embalm the deceased who present an increased risk of infection for training and education purposes.

Personal protective equipment

214 Your safe working practices should clearly specify what PPE should be worn in the designated clean and dirty areas of the funeral premises (such as the viewing room and embalming room). Anyone entering such areas should comply with these requirements; they will be different during procedures and after the areas have been decontaminated. SICPs and TBPs explain how PPE fits with other control precautions. However, for most routine activities single-use gloves and plastic aprons should give sufficient protection. People handling the deceased should always wear gloves and wash their hands afterwards. The safe working practices should set out where additional PPE is required.

Standard infection control precautions include making sure the following items are worn during embalming procedures and hygienic treatment:

- a surgical scrub suit;
- a plastic single-use apron to cover chest, trunk and legs;
- waterproof boots;
- single-use gloves;
- waterproof sleeve covers, where there is exposed skin and likely to be significant contamination.

Transmission-based precautions may include wearing the following additional PPE during embalming procedures and hygienic treatment for deceased with higher infection risk:

- a form of eye protection or plain unventilated visor to provide a physical barrier to droplets;
- a face mask to protect the mouth and nose from direct splash contamination if a visor is not worn;
- cut-resistant protective gloves, where appropriate to the activity.

Equipment and instruments

215 Base your decision on the requirements for equipment and instruments for hygienic treatment and embalming on the projected workload. Keep instruments sharp, clean and ready for use. Although there is no legal requirement on this, it is recommended that three sets of instruments should be available. This allows one set to be in use, a second ready for use and a third being cleaned and disinfected. Alternative approaches are also acceptable. All instruments should be cleaned after use in warm water and detergent (but not in the wash-hand basin). They can be disinfected by boiling (eg at 90 °C for 60 seconds) or soaking in an appropriate disinfectant.

Safe use of sharps

216 Use of safer sharps (ie with features or mechanisms that prevent or minimise the risk of accidental injury) is required in the healthcare sector; this is one way of managing the risk of sharps injuries. Where this is not feasible, you should implement procedures for safe use and disposal of sharps (eg prevent the recapping of needles; dispose of sharps in secure containers close to the work area).

Hygienic treatment

217 Hygienic treatment (sometimes known as first or last offices) includes washing, dressing, trimming hair and nails etc. The activities involved with this treatment could expose employees to the blood of the deceased through cutting

or piercing the skin. This could be intentional, eg during suturing, or unintentional, when cutting hair or nails.

218 Some procedures carried out as part of hygienic treatment may also involve emptying the contents of the bowel and bladder and entail the plugging of orifices. Such procedures could result in exposure to body fluids such as urine and faeces, which may present a risk of infection. You should consider the condition of the deceased, eg whether they have undergone a post-mortem examination or have undergone significant deterioration before any hygienic treatment. Where the deceased is known to present an increased risk of infection (see the list in Appendix 1) additional TBP's may be required.

Embalming

What is embalming?

Embalming is defined as the preservation of a body from decay through injection of a chemical embalming fluid. The preservative solution (the embalming fluid) replaces the blood as well as treating the body cavity and organs.

219 You or a member of your staff may carry out the embalming, or a trade embalmer may use your premises. Before embalming begins, staff should prepare the embalming room and equip it in accordance with the safe working practices.

Before embalming begins, embalmers should make sure that:

- an adequate supply of PPE is available;
- heavy-duty rubber gloves and aprons are readily available, if required;
- air supply and extraction systems are working properly;
- drains are clear, have been cleaned and the water supply is working;
- there is an adequate supply of soap, freshly prepared embalming fluids, disinfectants, detergent solutions and paper towels;
- tools and equipment required during embalming are properly maintained, clean and ready for use, and set out as required.

220 Embalming should only be undertaken when adequate controls are in place (as identified by the risk assessment) to prevent or minimise any risk of infection. It is essential that the funeral service provides any information about known or suspected infection risks from the deceased to the embalmer, preferably using the hazard notification sheet (Appendix 2). Some activity-specific precautions are given in the information box below.

Standard infection control precautions for embalming procedures

- Once used instruments are no longer required, clean them thoroughly in detergent solution.
- Never attempt to catch a falling instrument. To help prevent accidental falls, do not lay instruments down indiscriminately after use.
- Wherever possible, minimise operations likely to cause splashing or generate aerosols, such as washing down with high-pressure hoses and cleaning instruments under running water.
- If a sluice is included in the room, it should be fitted with a suitable cover to prevent aerosolising of fluids when flushed.
- Follow specified cleaning and disinfection procedures for decontamination of work, floor and wall surfaces and of equipment, including use of PPE, where appropriate.

221 The risk assessment should consider whether embalming needs to be carried out as not all bodies are embalmed. Consider the needs of the family, whether the body needs to be repatriated, and any other risks that embalming may present. Where the risks from embalming cannot be managed, offer alternatives to allow the family to view the deceased where this is feasible.

222 The embalming process involves direct contact with the body, exposure to blood and other body fluids, and the use of sharps (and hazardous chemicals). There may be additional risks when embalming the deceased who have been involved in an accident or have undergone post-mortem examination, eg exposure to damaged bones/bone splinters. Take extra care when passing embalming fluid into a body that has undergone a post-mortem examination as larger blood vessels normally used for infusion may be damaged or severed and may result in embalming fluids leaking from the body.

223 To minimise the risk of transmission of microorganisms during embalming, you should use techniques that make sure that liquid dispersion and splashing are minimised and that all instruments likely to cause puncture wounds or cuts are handled appropriately.

224 During embalming, you should keep the number of sharp instruments present on the embalming table or trolley to a minimum. Place any used disposable sharp instruments, such as scalpel blades, directly in a suitable sharps container. Use blunt-ended scissors and scalpel blades whenever possible. Where required to change scalpel blades, use safe working practices.

Transmission-based precautions for deceased who present an increased risk of infection

225 Where the deceased are not properly identified, particularly where there is no satisfactory hazard notification form or in suspicious death cases, you should:

- label and treat such bodies as increased infection risk cases, unless additional information becomes available;
- enclose all deceased labelled increased-risk in a leak-proof body bag marked in accordance with safe working practices.

226 Where a decision has been made to embalm the deceased known to present an increased risk of infection, use TBPs in addition to SICPs. You should consider the condition of the body as part of the risk assessment.

227 All embalmers should be adequately trained and competent in performing embalming on increased-risk cases and should work according to safe working practices.

228 For the deceased known to present an increased risk of infection, your risk assessment should consider whether the embalmer requires a second person to assist. It is advisable to have one embalmer to carry out the invasive procedures and a second person to assist with the process.

229 The embalmer is always responsible for the safety of invasive procedures, but they may authorise a suitably trained assistant to help with this work. The assistant should not handle sharp instruments or tools unless specifically instructed to do so by the embalmer. The embalmer and assistant should not handle sharp tools and instruments at the same time.

230 Everyone in the embalming room should obey warnings from any member of the embalming team and stop work until the matter has been resolved.

231 If PPE becomes heavily soiled, change it immediately. At the end of the embalming all PPE worn during the procedure should be disposed of correctly or treated, where appropriate, as contaminated linen and, for example, collected in suitable bags and cleaned properly. Further information on safe management of linen is provided in paragraphs 81–85.

Embalming the deceased who have been infected with hazard group 4 microorganisms

232 Embalming must never be carried out on known hazard group 4 infected cases, eg viral haemorrhagic fever (see Appendix 1 for details).

Visitors and observers in funeral premises

233 Visitors to the facility should not normally be admitted to the embalming room while it is operative.

234 Sometimes workers such as maintenance personnel will need access to the embalming room. They should be allowed to enter only under a permit-to-work system, where this is practical, or with supervision in smaller premises, and should be excluded until the room has been cleaned.

Religious or ritual preparations

235 There are considerable variations between people of different faiths, ethnic backgrounds and national origins in their approach to, and practices for, death and dying, as regards preparation for burial or cremation.

236 At the time of death, these practices may require involvement in last or first offices. If there is a requirement for involvement, you should inform people carrying out washing, dressing etc of any risks and advise them of the control measures to be used. The responsible person should advise families if there could be a health risk from touching or kissing the body. If these risks are significant, discourage the family members from doing so and explain about the possible consequences for their health. This should be done tactfully and ideally by a trained member of staff.

Viewing

237 When families and others wish to view the deceased, you should advise them whether there is a risk of infection if they touch or kiss the deceased, as well as any controls they should take after contact, eg washing of hands.

238 Certain infectious diseases (see Appendix 1 for details) will present a significant risk, so you should inform the family about the risks involved and provide them with PPE if appropriate. Alternatively, viewing could take place either at a distance or by use of a viewing panel in the coffin. Another option is to use a viewing room with a glass screen.

Managing the risks of infection during exhumations

239 This section is aimed at those involved with exhuming the deceased. It outlines the risks to consider and the safe working practices to control those risks. This guidance does not cover exhumation in criminal investigations; for additional procedures that may be required in these cases you should consult the College of Policing at <http://www.college.police.uk/Pages/Home.aspx>.

Exhumations

240 The Ministry of Justice issues the majority of licences for the exhumation of the deceased each year (approximately 1000), and the Church of England chancellors also authorise a small number via a faculty. In addition, some exhumations result from an accidental disturbance in road or building construction. The main reasons for planned exhumations are:

- redevelopment of old cemeteries or crypts, often with associated archaeological investigations;
- medical or criminal investigations;
- individual requests for exhumation from family members for reburial or cremation;
- archaeological reasons.

Risk of infection

241 In the vast majority of cases, the risk of infection from the deceased who have been exhumed is negligible. There may be additional infection risks from the environment that need to be considered. In certain cases, where the microorganism can survive for prolonged periods or where the deceased's remains have been preserved, the potential for infectious microorganisms being present increases.

242 Although infectious microorganisms may present a risk to people carrying out exhumation of the recently deceased, the majority of these microorganisms will no longer be viable after about six months. However, if the deceased has died from a transmissible spongiform encephalopathy (eg CJD), they may remain viable for a substantial period of time.

243 Of the organisms that caused mass death in the past (eg plague, cholera, typhoid, tuberculosis, anthrax and smallpox) only anthrax is likely to survive in the deceased for any significant length of time following death (because it can form highly resistant spores) and should be considered in any risk assessment. You may find it helpful to examine items such as parish records or similar records that may give information on the cause of death for a particular exhumation site. Further information on these agents, and others that may be present in the environment, is given in Table 2.

244 In addition to the infectious microorganisms that may be present in the recently deceased, soil in a burial site could also present a source of infection because of contamination.

245 Where bodies have been preserved in airtight (lead-lined) coffins or crypts, there is the potential for the microorganisms to survive for prolonged periods.

Standard infection control precautions

246 The requirements in paragraphs 59–98 apply to exhumations; however, some elements that are specific to exhumation sites should be considered, but may be altered depending on the situation (see the information box).

Standard infection control precautions for exhumation sites

- Suitable facilities should be provided on site for staff to wash, with soap and clean hot and cold, or warm, running water. For more information on washing facilities, see HSE guidance at www.hse.gov.uk/construction/healthrisks/welfare/toilets-and-washing.htm.
- Hands (and arms, if necessary) should be washed before eating, drinking, smoking, using the telephone, applying make-up, or leaving the work area.
- Hands should be washed even if gloves have been worn.
- If your employees do not have direct access to warm running water to wash their hands at the site, you should provide portable washing facilities.

247 Where on-site exhumation is undertaken, arrangements should be made to clearly demarcate the clean and dirty areas and to provide washing and decontamination facilities on site. This will enable employees to wash and place contaminated clothing, waste etc on site, before leaving or moving to clean areas, such as site offices.

248 Your risk assessment should take into account the likelihood of exposure to blood and body fluids and contact with the deceased during exhumation.

249 Cover all existing cuts and grazes with waterproof dressings and/or gloves before starting any work that involves contact with the deceased. If cuts and/or grazes occur during work, wash them immediately.

250 You should avoid hand-to-mouth/nose or hand-to-eye contact. Take care with pens etc; these should not be put in the mouth or taken from dirty to clean areas.

251 Take rest breaks and meal breaks away from the main work area. Employees should remove any PPE and contaminated clothing when leaving a dirty work area and not enter clean areas wearing PPE.

252 When exhuming soil from burial sites, most of the soil will be used to refill the excavation. The soil that was removed from immediately above and around the coffin should be replaced first. Where there are mass exhumations, there may be large quantities of coffin waste, which should be securely bagged and sent to landfill. Almost all mass exhumations will be from old burial grounds, so the infection risk is low and landfill disposal is usually appropriate. Testing of soil samples for microorganisms is necessary only where the risk assessment indicates a high risk of contamination. Further information on sampling is provided in *Guidance on assessing risk of anthrax on building land*.²² Disinfectants are likely to be soaked up by soil and rendered ineffective, so their use may present a greater chemical hazard than the benefits they are likely to achieve.

Personal protective equipment

253 Appropriate protective equipment and clothing should be selected and worn based on the nature of the risk (see the information box).

254 You should dispose of all single-use clothing as clinical waste. Reusable clothing should be washed appropriately and separately from other uncontaminated clothing. Equipment such as boots and face visors should be washed and decontaminated, then dried and stored in a clean area.

The following personal protective equipment should be worn for exhumations:

- heavy-duty overalls;
- waterproof trousers and jackets;
- working boots with toe and sole protection;
- waterproof heavy-duty gloves;
- a standard construction site helmet (hard hat);
- a face visor, if there is a likelihood of splashing.

Respiratory protective equipment

255 In most exhumations RPE is unlikely to be necessary for protection from infectious microorganisms. However, when carrying out exhumations in crypts, unless there is sufficient information to indicate otherwise, use RPE as a precautionary measure. This will not only protect against the inhalation of infectious microorganisms, but it will also protect employees from wood and lead dust (its main purpose). Surgical masks do not provide suitable respiratory protection. RPE should always be fitted with the highest efficiency filter possible (FFP3) and provide a protection factor of at least 20 to control exposure of microorganisms down to the lowest levels.

256 Tight-fitting face pieces should be face-fit tested to the individual wearing it and appropriate training should be provided on the safe use of the equipment. You should store and maintain RPE in accordance with its use. *Respiratory protective equipment at work: A practical guide*¹⁸ provides further information.

Equipment and instruments

257 All equipment (eg vehicles, removal shells, trolleys and excavation equipment) should be easy to clean and decontaminate. In most cases it is very unlikely that there will be any risk of infection. However, where the risk assessment identifies an increased risk of infection, all equipment should be cleaned and disinfected as required. This could take place at the end of a procedure and/or before the equipment leaves the site.

Transmission-based precautions for exhumation

258 It is possible for organisms that cause anthrax or smallpox to survive for significant periods of time in the deceased; therefore before starting work you should check whether there is any evidence that these agents were linked to the cause of death. If so, those carrying out the exhumation should try to make sure that the coffins remain intact. In most cases such coffins should not be opened. However, if there is a reason to open the coffin, an additional risk assessment must be carried out which considers the serious consequences of a release of these infectious agents and you should also follow the guidance in paragraphs 260–261.

259 If the integrity of a lead-lined coffin fails when exhumed you should:

- Clear the area of all personnel. Disinfect all reusable PPE effectively, disinfect other clothing, and bag all single-use PPE and send it for incineration.

- Contact a suitably qualified expert (such as a pathologist) to inspect the body (while wearing appropriate PPE) to see if it shows evidence of smallpox or anthrax. If there is no evidence of these agents then the exhumation may resume.

260 If there is evidence of smallpox or anthrax, the expert should contact the Rare and Imported Pathogens Laboratory at Public Health England at www.gov.uk/government/collections/rare-and-imported-pathogens-laboratory-ripl to obtain advice about appropriate infection control, sending of specimens and testing.

261 If the evidence suggests smallpox or anthrax infection is suspected, you should:

- Make the area secure and post 24-hour security to ensure that there is no entry into the area until a final report is received. You should inform local police who may wish to put in place additional security arrangements.
- Inform the local environmental health officer and contact specialist inspectors at the HSE Microbiology and Biotechnology Unit (MBU) at bioagents@hse.gov.uk.

Table 2 Microorganisms that should be considered when exhuming a body

Agent (disease)	Means of transmission	Survivability	Guidance notes
<i>Bacillus anthracis</i> (anthrax)	Breathing in aerosols, direct contact with broken skin, and by hand-to-mouth contact	Probably indefinitely in the spore form	Anthrax spores may be found in the exhumed body, and also in items such as pillows and linings stuffed with horsehair. Anything stuffed with animal hair should be bagged and disposed of as clinical waste
<i>Variola major</i> virus (smallpox)	Inhalation and contact	Can survive for long periods of time in dry scabs (13 years has been documented). However, in normal environmental conditions, the virus is very unlikely to survive for more than 48 hours	The virus that caused smallpox has been eliminated from the world population and the last cases that occurred in this country were mainly in the 1930s. There were sporadic cases after that but none since the 1970s. Intact virus was found in a body exhumed at Spitalfields in 1985. This body was more than 100 years old. However, the virus could not be grown so was not considered to be infective
<i>Clostridium tetani</i> (tetanus)	Skin-penetrating injury	Commonly found in soil	Employees should be immunised against tetanus. You should make sure that this remains current
<i>Leptospira icterohaemorrhagiae</i> (Weil's disease)	Contact with broken skin	Found in association with rats	Agent is excreted in infected rat urine, so soil/water present on site may be contaminated

Appendix 1: Application of transmission-based precautions to key infections in the deceased

The causative agents for the key infections listed below have been arranged according to the most likely route of transmission, taking account of the activity when handling the deceased, eg through post-mortem and embalming.

Infection	Causative agent	Hazard group	Is a body bag needed ¹ ?	Can the body be viewed?	Can post-mortem be carried out?	Can hygienic treatment be carried out?	Can embalming be carried out?
Airborne Small particles that can remain airborne with potential for transmission by inhalation							
Tuberculosis	<i>Mycobacterium tuberculosis</i>	3	Yes	Yes ²	Yes ³	Yes	Yes ³
Middle East respiratory syndrome (MERS)	MERS coronavirus	3	Yes	Yes	Yes ³	Yes	Yes ³
Severe acute respiratory syndromes (SARS)	eg SARS coronavirus	3	Yes	Yes	Yes ³	Yes	Yes ³
Droplet Large particles that do not remain airborne for very long and do not travel far from source with potential for transmission via mucocutaneous routes (ie mouth, nose or eyes)							
Meningococcal septicaemia (meningitis)	<i>Neisseria meningitidis</i>	2	No	Yes	Yes ⁵	Yes	Yes ⁵
Flu (animal origin)	eg H5 and H7 influenza viruses	3	No	Yes	Yes ⁵	Yes	Yes ⁵
Diphtheria	<i>Corynebacterium diphtheriae</i>	2	No	Yes	Yes	Yes	Yes
Contact Either direct via hands of employees, or indirect via equipment and other contaminated articles where transmission is primarily via an ingestion route							
Invasive streptococcal infection	<i>Streptococcus pyogenes</i> (Group A)	2	Yes	Yes	Yes ⁵	No	No
Dysentery (shigellosis)	<i>Shigella dysenteriae</i> (type 1)	3	No ⁶	Yes	Yes	Yes	Yes
Hepatitis A	Hepatitis A virus	2	No ⁶	Yes	Yes	Yes	Yes
Hepatitis E	Hepatitis E virus	3	No ⁶	Yes	Yes	Yes	Yes
Enteric fever (typhoid/paratyphoid)	<i>Salmonella typhi/paratyphi</i>	3	No ⁶	Yes	Yes	Yes	Yes
Brucellosis	<i>Brucella melitensis</i>	3	No	Yes	Yes ⁴	Yes	Yes ⁴
Haemolytic uraemic syndrome	Verocytotoxin/shiga toxin-producing <i>E.coli</i> (eg O157: H7)	3	No ⁶	Yes	Yes ⁴	Yes	Yes ⁴

Infection	Causative agent	Hazard group	Is a body bag needed ¹ ?	Can the body be viewed?	Can post-mortem be carried out?	Can hygienic treatment be carried out?	Can embalming be carried out?
Contact Either direct or indirect contact with blood/other blood containing body fluids via a skin-penetrating injury or via broken skin and through splashes of blood/other blood containing body fluids to eyes, nose and mouth							
Acquired immune deficiency syndrome (AIDS)-related illness	Human immunodeficiency virus	3	No	Yes	Yes ⁷	Yes	Yes ⁷
Anthrax	<i>Bacillus anthracis</i>	3	Yes	No	Yes ⁸	No	No
Hepatitis B, D and C	Hepatitis B, D and C viruses	3	No	Yes	Yes ⁷	Yes	Yes ⁷
Rabies	Lyssaviruses	3	No	Yes	No	No	No
Viral haemorrhagic fevers	Specifically Lassa fever, Ebola, Marburg, Crimean-Congo haemorrhagic fever viruses	4	Yes ⁹	No	No	No	No
Contact Either direct or indirect contact with body fluids (eg brain and other neurological tissue) via a skin-penetrating injury or via broken skin							
Transmissible spongiform encephalopathies (eg CJD)	Various prions	3	Yes	Yes	Yes ¹⁰	Yes	No
Key							
Red Minimise procedures or handling of the deceased							
Yellow TBPs are necessary when carrying out procedures or handling the deceased							
The highlighted areas indicate an increased level of risk associated with the infection to workers (with areas in red posing increased risk) and therefore require additional control measures when handling the deceased.							
Notes							
¹ It is advised that a body bag is used for the deceased in all cases where there is, or is likely to be, leakage of body fluids. ² With appropriate measures to deal with potential release of aerosols (eg place cloth or mask over mouth when moving the deceased). ³ With appropriate measures to deal with aerosol-generating procedures. ⁴ With measures to minimise environmental contamination (because of low infectious dose; ie the amount of pathogen or number of bacteria required to cause an infection is low). ⁵ With appropriate measures to prevent exposure of mucosal surfaces (eg a physical barrier to protect eyes, mouth and nose, such as a facemask or visor). ⁶ Although illness may have increased likelihood of leakage of body fluids. ⁷ With appropriate robust measures for the use of sharps (eg minimise use or use safer sharps devices). ⁸ Before undertaking a procedure, the rationale for a post-mortem should be carefully considered where anthrax infection is suspected, particularly where examination may increase the potential for aerosol generation. ⁹ With double body bag. ¹⁰ With appropriate measures to minimise percutaneous injury and contamination of work area, and to help with decontamination (eg high-level sharps control or dedicated equipment).							

Hazard groups

The Approved List of biological agents (www.hse.gov.uk/pubns/misc208.pdf) provides the approved classification of biological agents into hazard groups (as referred to in COSHH). The hazard groups are defined in the following table; when classifying a biological agent it should be assigned to one of these four groups according to its level of risk of infection to humans.

Group	Definition
Group 1	Unlikely to cause human disease
Group 2	Can cause human disease and may be a hazard to employees; it is unlikely to spread to the community and effective prophylaxis or treatment is usually available
Group 3	Can cause severe human disease and may be a serious hazard to employees; it may spread to the community, but effective prophylaxis or treatment is usually available
Group 4	Causes severe human disease and is a serious hazard to employees; it is likely to spread to the community and usually no effective prophylaxis or treatment is available

Notification of reportable diseases

Certain diseases are reportable under national legislation. Please refer to the relevant legislation for notifiable diseases:

England – Health Protection (Notification) Regulations 2010
<http://www.legislation.gov.uk/uksi/2010/659/schedule/1/made>

Wales – Health Protection (Notification) (Wales) Regulations 2010
<http://www.legislation.gov.uk/wsi/2010/1546/schedule/1/made>

Scotland – Public Health etc (Scotland) Act 2008
<http://www.legislation.gov.uk/asp/2008/5/schedule/1>

Appendix 2: Hazard notification sheet

1	Name of deceased		
2	Date and time of death		
3	Source (hospital, ward or other)		
4 Infection risk from the deceased¹			
4a	Does the deceased present an infection risk? (Ring as appropriate)		
	Yes	Suspected	None suspected
4b	If yes, what are the likely routes of transmission? (Ring all that apply) ²		
	Airborne	Droplet	Contact
4c	Infection (if permitted to disclose) ³		
4d	Provide any relevant information to enable the deceased to be handled safely ⁴		
5 Condition of the deceased⁵			
5a	Is the deceased leaking body fluids? Please provide details		
5b	Have accessories that present a risk of sharps injury been removed?		
5c	If yes, have the puncture points been covered or sealed?		
5d	If no, please provide details and location		
5e	Does the deceased have an implantable device? (Ring as appropriate)		
	No	Yes and switched off	Yes but not switched off
5f	If yes, please provide details and location		
5g	Was the deceased receiving radiotherapy? (If yes, please provide details)		
6	Signed⁶		
	Print name		
	Institution		

This information needs to be handled sensitively and securely to ensure confidentiality of the deceased's personal information. It should be shared only with those who need it to handle the deceased safely (as required by the Health and Safety at Work etc Act 1974). This form provides one means of sharing the pertinent information.

Notes

- ¹ Providing sufficient information on infection risks from handling the deceased will enable the appropriate precautions to be taken. Where infection is the primary cause of death, please ring 'Yes' for Q4a. Infection may not be the primary cause of death but if the deceased was suffering from an infection, please ring 'Yes' or 'Suspected' for Q4a. Where there are no indications that the deceased was suffering from an infection, or where the deceased was on a course of antimicrobial medication that would minimise the infection risk, please ring 'None suspected' for Q4a and proceed to section 5, 'Condition of the deceased'.
- ² When handling the deceased, standard infection control precautions (SICPs) are considered the minimum protective measures to be used. In Q4b provide information on how exposure to infection may occur. This will help those handling the deceased to consider adopting additional control measures (transmission-based precautions or TBPs) appropriate to the route by which they can be exposed and transmission can occur.
- ³ If the infection is known it is helpful, though not essential, to provide specific details in Q4c of the infectious agent, to inform the risk assessment and assist with possible treatment should exposure occur. This information may only be disclosed with prior permission of the deceased or their family.
- ⁴ In Q4d provide any information relevant to infection risk that may assist in deciding whether and how the deceased should be handled during viewing, preparing (hygienic preparation), embalming, post-mortem examination or exhumation. For example, indicate why a body bag has been used, whether a body bag is necessary, and details of any counter-indications that may prevent specific activities (eg embalming) being performed. It may be appropriate to consult Appendix 1 of this publication (*Managing infection risks when handling the deceased*) for further information.
- ⁵ In section 5 provide information on the condition of the deceased that would be helpful in deciding whether and how they should be handled. It highlights important issues, eg sharp medical devices or implantable devices (eg pacemakers), their location and whether they need to be removed.
- ⁶ In hospital cases, the doctor and/or nursing staff with knowledge of the deceased's condition is asked to sign section 6 of this form. Where a post-mortem examination has been undertaken, the pathologist (or qualified anatomical pathology technologist) is asked to sign. In non-hospital situations (eg community setting), the doctor with knowledge of the deceased's condition is asked to sign.

Appendix 3: Cleaning and disinfection

1 Cleaning and disinfection are part of applying SICPs. They are particularly important where you need to control the risk of exposure to infectious microorganisms in the workplace, including work surfaces, tables, benches and floors, equipment and PPE. Staff should also clean all floor drains and gullies when in use. Regular cleaning using detergent and warm water is usually adequate for facility surfaces. It will render areas physically cleaner; it will remove organic matter and some of the microorganisms that are associated with soiling. Effective removal of organic matter is important before any disinfection can take place, as organic matter can neutralise the action of the disinfectant.

2 The manner in which the cleaning and disinfection is undertaken is important (eg using wetted physical cleaning methods for cleaning large areas to avoid creating infectious aerosols). Disinfection procedures should specify which types of disinfectant should be used where, and for what purpose. This is because different disinfectants may be effective for some surfaces but not for others, or they may be effective only against certain groups of microorganisms. For healthcare settings, the procedures should be compatible with the hospital trust's policy. The Association of Healthcare Cleaning Professionals' (AHCP) *Revised healthcare cleaning manual*²³ provides guidance on cleaning techniques and best practice. Although it is aimed at healthcare settings, similar principles will apply in funeral premises. In all cases, the procedures should state the in-use dilution and contact time needed for the disinfectant to be effective. This information is typically provided by the disinfectant manufacturer. It may be appropriate to use more than one type of disinfectant depending on the types of microorganism anticipated.

3 Staff should also have suitable instruction and training on cleaning and use of these disinfectants. Staff should make sure that adequate supplies of disinfectants at in-use concentrations are available throughout the facility for both standard procedures and emergency clean-up. Most disinfectants are hazardous and should always be stored and handled in accordance with the supplier's instructions and COSHH; for example:

- make sure that the disinfectant does not cause any health problems for your employees (eg exposure to gaseous emissions from repeated use of chlorinated disinfectants can cause breathing problems for some);
- make sure that any chemicals used for cleaning are compatible with each other and/or with other chemicals that might be in use (eg when formaldehyde comes into contact with a source of free chlorine, such as hypochlorite disinfectants, harmful chemical by-products may be formed).

Equipment and instruments

4 Effective cleaning and disinfection of instruments protects the people using them. In healthcare settings, an automated washer-disinfector should be provided for the cleaning and disinfection of reusable instruments after use. Many hospital mortuaries have their own sterilisation equipment, maintained by sterile services, which means that instruments are not mixed with those from live patients and the turnaround time is quicker.

5 Staff should segregate equipment for reuse from single-use items. Place reusable equipment in containers with solid sides and bottoms, made of metal or autoclavable plastics, and which allow adequate steam penetration throughout the equipment inside during sterilisation.

6 Follow manufacturers' guidance for use and decontamination of all equipment. After decontamination, you must rinse and dry the equipment then store it clean and dry.

Spillages

7 As well as carrying out routine cleaning, you should have arrangements in place to deal with spillages, eg of blood and other body fluids. This may occur during a post-mortem examination, hygienic preparations or embalming. Spillages need to be dealt with promptly and in line with the safe working practices. Depending on the size and nature of any spillage, an assessment should determine which is appropriate: direct disinfection or detergent cleaning followed by disinfection. When assessing how to decontaminate potentially infectious material, you should take into account the volume and spread of organic matter. Many disinfectants can also be less effective because they are incompatible with some detergents and other chemicals.

Appendix 4: Health surveillance and immunisation

Health surveillance

- 1 Health surveillance allows for early identification of ill-health and helps identify any corrective action needed. Health surveillance is required by law if your employees are exposed to biological agents among a range of other substances hazardous to health.
- 2 Employers should provide employees with information about the sorts of infection that are relevant to their work and the symptoms that can occur. They should train employees to exercise personal vigilance so that prompt medical attention is sought if they develop early signs of infection.
- 3 Some degree of health check of employees is warranted before they handle the deceased. This may involve completing a questionnaire; the results of this will indicate whether there is a need to see an occupational health nurse or physician.
- 4 The occupational health department or a qualified adviser should advise on the health surveillance requirements and immunisation arrangements for staff directly handling the deceased and for those who visit the mortuary or funeral premises regularly.

Immunisation

- 5 Where there is a risk of exposure to infectious microorganisms for which effective vaccines are readily available, COSHH requires employers to make these vaccines available to employees who are exposed to biological agents. As this is a specific requirement under health and safety law, employers cannot charge their employees for such vaccines.
- 6 For some vaccines, a pre-exposure screening programme and appropriate follow-up assessments may be necessary to show whether employees are immune to the relevant microorganism. The screening records should include the dates of an employee's vaccinations and when any boosters or follow-up screenings are due.
- 7 The need for specific immunisations should be based on the guidance *Immunisation against infectious disease* from the Department of Health and Public Health England.²⁴ In most cases, mortuary and funeral service staff who handle the deceased will need to be immunised, as a minimum, against Hepatitis B, tetanus and tuberculosis.
- 8 Immunisation should, however, be seen only as a supplement to reinforce SICPs (and TBPs where necessary), procedural controls and the use of PPE.
- 9 When employers provide vaccines they should make sure that employees are aware of the advantages and disadvantages of immunisation, and its limitations.
- 10 The employer responsible for the premises should co-operate with the employers of other people who may visit their premises (for example, at a post-mortem examination) to make sure that those who may be at risk are suitably immunised.

Record keeping

11 Keep accurate occupational health records for all staff exposed to microorganisms. These records include:

- the type of work the employee does;
- dates of when work was started and, when appropriate, finished;
- the biological agents to which they have been exposed;
- records of any exposures, accidents or incidents;
- records of any vaccines given and the checks that were made to ensure protection.

12 Arrangements should be in place to make sure that staff are recalled and followed up for re-immunisation and boosters. Health records must be maintained in most cases for 10 years following the last known exposure. In certain instances, such as work exposure to *Mycobacterium tuberculosis*, CJD and some blood-borne viruses, the records may need to be kept for 40 years from the date of the last entry.

13 Employers should monitor the health of their staff and note and act upon occurrences of work-related illness, such as sickness absence. Active health surveillance will be required for sharps injuries and following exposure to pathogens associated with latency (eg *Mycobacterium tuberculosis*). For more information, see HSE's guidance on health surveillance at www.hse.gov.uk/health-surveillance/index.htm.

Appendix 5: Managing exposure and post-exposure prophylaxis

1 Procedures must be in place to deal with any accidental exposure of staff to infectious microorganisms. Such exposures might include:

- splashing of blood or body fluids on to mucous membranes, ie eyes, nose or mouth;
- contaminated sharps injury that breaks the skin;
- contamination of broken skin.

2 If the skin is intact it protects against most microorganisms. However, if it is broken, eg through cuts or abrasions, or chronic dermatitis such as eczema, then transmission may occur.

Immediate actions to take after exposure

3 Where someone is contaminated with blood or other body fluids through a sharps injury or a body fluid splash on to mucous membranes, take the following action without delay.

- Wash splashes off the skin with soap and running water.
- If the skin is broken, encourage the wound to bleed. Do not suck the wound, but rinse it thoroughly under running water. Do not swallow the water.
- Record the source of decontamination.
- Report the incident to a supervisor, line manager or health and safety adviser and occupational health department or medical adviser if there is one.

4 It is important to get prompt medical advice. The circumstances of the incident need to be assessed and consideration given to any medical treatment required. Post-exposure prophylaxis may be needed after exposure to a blood-borne virus, but to be effective, it may need to be started quickly. Where the workplace does not have a medical adviser, contact the nearest accident and emergency department without delay.

5 For more information, see HSE guidance at www.hse.gov.uk/biosafety/blood-borne-viruses/.

Appendix 6: Dealing with incidents and accidents

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

1 All employers, the self-employed and people in control of work premises have duties under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR).²⁵ They must report certain work-related injuries, cases of ill-health and dangerous occurrences. HSE will pass details to the relevant enforcing authority.

2 Reporting under RIDDOR does not suggest the acceptance of responsibility or liability. It is simply informing the enforcing authority that an incident has occurred. Under RIDDOR, it is an offence not to report.

Reporting occupational diseases

3 Employers must report certain occupational diseases where they are likely to have been caused or made worse by the work carried out. This includes any disease attributed to an occupational exposure to a biological agent where this has been confirmed by a medical practitioner. For more information on RIDDOR in health and social care, see HSE guidance at www.hse.gov.uk/healthservices/riddor.htm.

4 A report should be made whenever there is reasonable evidence suggesting that a work-related exposure was the likely cause of the disease. The doctor may indicate the significance of any work-related factors when communicating their diagnosis.

5 The self-employed have similar duties to report occupational diseases attributed to their own work. You can find more information about reporting at www.hse.gov.uk/riddor.

What you need to do as an employer

6 Employers should devise and implement a mechanism for reporting and responding rapidly and effectively to: accidents where an injury results; incidents where there was potential for injury or ill-health to result; and cases of ill-health. For effective monitoring of health and safety arrangements, the internal reporting system should take account of *all* incidents and accidents that occur on the premises, not just the more serious ones. This will help ensure that lessons are learned and safe systems of work are improved where necessary.

7 You should encourage employees to report any incidents of ill-health. Safe working practices should cover the arrangements for:

- the immediate action to take in the event of an accident, fire or other emergency, especially where there is a risk of infection. This should include details of where to go to receive medical treatment or assessment;
- reporting, recording and investigating accidents, incidents and ill-health;
- notifying employees and their representatives of the causes of the incident and the remedial measures needed.

Glossary

Airborne transmission A route of transmission for infection. It consists of small particles that can remain airborne and travel considerable distance.

APT Anatomical pathology technologist

Contact transmission A route of transmission for infection. It can be either direct, via hands of employees, or indirect, via equipment and other contaminated articles.

CJD Creutzfeldt-Jakob disease.

Down-draught table A workstation with built-in ventilation to capture and filter dust and other contaminants and draw them away from the operator's breathing zone and material being worked on.

Droplet transmission A route of transmission for infection. It consists of large particles that do not remain airborne for very long and do not travel far from their source.

Holding room An unrefrigerated storage room in which an unconfined body would lie when the visiting room is in use. This room would not be used for a visit by family or friends.

Increased risk The deceased who present a higher risk to employees because of a known or suspected risk of infection.

LEV Local exhaust ventilation. A ventilation system that takes dusts, mists, gases, vapour or fumes out of the air so that they cannot be breathed in. Properly designed LEV will collect the air that contains the contaminants; make sure the air is contained and taken away from people; clean the air (if necessary) and get rid of the contaminants safely.

Mortuary An area where the deceased are handled. This term can apply to the post-mortem sector or funeral premises.

PPE Personal protective equipment (eg gloves, aprons and face masks).

RPE Respiratory protective equipment. The two main types of RPE are respirators and breathing apparatus. Respirators use filters to remove contaminants from the air and prevent them being breathed in. Breathing apparatus needs a supply of breathing-quality air from an independent source (eg air cylinder or air compressor).

SICPs Standard infection control precautions. These are the minimum control measures that should be implemented to manage the risk of exposure from all work activities involving the deceased.

Staff room An area for employees that is separate from work areas and is considered a 'clean' area.

TBPs Transmission-based precautions. These are control measures that should be implemented when the deceased are known or suspected to have an infection. These should be implemented, as required, in addition to the standard precautions. Transmission-based precautions are categorised according to the route of transmission of the infectious agent, ie airborne, droplet or contact transmission.

Viewing room A separate area in a mortuary or funeral home that is made available for families or friends wishing to view the deceased privately.

References

- 1 Health and Safety at Work etc Act 1974 The Stationery Office
www.legislation.gov.uk/ukpga/1974/37
- 2 Management of Health and Safety at Work Regulations 1999
The Stationery Office www.legislation.gov.uk/uksi/1999/3242/contents/made
- 3 Control of Substances Hazardous to Health Regulations 2002
The Stationery Office www.legislation.gov.uk/uksi/2002/2677/contents/made
- 4 The Health and Safety (Sharp Instruments in Healthcare) Regulations 2013
www.legislation.gov.uk/uksi/2013/645/pdfs/uksi_20130645_en.pdf
- 5 *Health and Safety (Sharp Instruments in Healthcare) Regulations 2013: Guidance for employers and employees* www.hse.gov.uk/pubns/hsis7.pdf
- 6 *Ebola: Information for the funeral industry, coroners' offices and pathology departments* Public Health England www.gov.uk/government/uploads/system/uploads/attachment_data/file/404086/Ebola_Information_for_the_Funeral_Industry_v2.pdf
- 7 *The NHS Scotland national infection prevention and control manual (NIPCM)* www.nipcm.scot.nhs.uk/
- 8 *Health Technical Memorandum 07-01: Safe management of healthcare waste* Department of Health www.gov.uk/government/publications/guidance-on-the-safe-management-of-healthcare-waste
- 9 *HTA Codes of Practice and Standards: Code B: Post-mortem examination* Human Tissue Authority <https://www.hta.gov.uk/hta-codes-practice-and-standards-0>
- 10 *Confidentiality: Good practice in handling patient information* General Medical Council <https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/confidentiality/managing-and-protecting-personal-information#paragraph-134>
- 11 *Medical device alert: Implantable cardioverter defibrillators (ICDs)* Medicines and Healthcare Products Regulatory Agency www.gov.uk/drug-device-alerts/medical-device-alert-implantable-cardioverter-defibrillators-icds-disable-all-high-voltage-shock-therapies-before-you-remove-icd
- 12 *Association of Anatomical Pathology – Post-mortem standards* (not publicly available) <http://www.aaptuk.org/professional-support>
- 13 *Care after death: Guidance for staff responsible for care after death* (Hospice UK and National Nurse Consultant Group, Palliative Care) www.hospiceuk.org/what-we-offer/publications?cat=72e54312-4ccd-608d-ad24-ff0000fd3330

- 14 *Health Building Note 20 – Facilities for mortuary and post-mortem room services (England and Wales)* Department of Health www.wales.nhs.uk/sites3/Documents/254/HBN%2020%203rded%202005.pdf
- 15 *Mortuary and post mortem facilities: Design and briefing guidance (Scottish Health Planning Note 16-01)* NSS Health Facilities Scotland <http://www.hfs.scot.nhs.uk/publications/1510306816-20171107%20SHPN%2016-01%20Mortuary%20v2.0.pdf>
- 16 *Workplace (Health, Safety and Welfare) Regulations 1992 Approved Code of Practice* HSE 2013 www.hse.gov.uk/pubns/books/l24.htm
- 17 *Minimise transmission risk of CJD and vCJD in healthcare settings* Advisory Committee on Dangerous Pathogens' Transmissible Spongiform Encephalopathy (ACDP TSE) Subgroup www.gov.uk/government/publications/guidance-from-the-acdp-tse-risk-management-subgroup-formerly-tse-working-group
- 18 *Respiratory protective equipment at work: A practical guide* HSE 2013 www.hse.gov.uk/pubns/books/hsg53.htm
- 19 *Management of Hazard Group 4 viral haemorrhagic fevers and similar human infectious diseases of high consequence* Advisory Committee on Dangerous Pathogens www.gov.uk/government/publications/viral-haemorrhagic-fever-algorithm-and-guidance-on-management-of-patients
- 20 *Annex H After Death in Minimise transmission risk of CJD and vCJD in healthcare settings* Advisory Committee on Dangerous Pathogens' Transmissible Spongiform Encephalopathy (ACDP TSE) Subgroup www.gov.uk/government/uploads/system/uploads/attachment_data/file/209766/Annex_H_-_After_death.pdf
- 21 *Management, design and operation of microbiological containment laboratories* Advisory Committee on Dangerous Pathogens 2001 HSE 2001 www.hse.gov.uk/pubns/books/microbio-cont.htm
- 22 *Guidance on assessing risk of anthrax on building land* Public Health England www.gov.uk/government/publications/anthrax-assessing-risk-of-anthrax-on-building-land
- 23 *Revised healthcare cleaning manual* Association of Healthcare Cleaning Professionals (AHCP) www.ahcp.co.uk/downloads/revised-healthcare-cleaning-manual-2009-06-v2.pdf
- 24 *Immunisation against infectious disease* Public Health England www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book
- 25 *Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013* The Stationery Office www.legislation.gov.uk/uksi/2013/1471/made

Further reading

HSE guidance

Self-employed www.hse.gov.uk/self-employed

New and expectant mothers www.hse.gov.uk/mothers

Managing health and safety www.hse.gov.uk/managing/

Risk assessment www.hse.gov.uk/risk/index.htm

Gloves www.hse.gov.uk/skin/employ/gloves.htm

Hand washing www.hse.gov.uk/skin/posters/skinwashing.pdf

Washing facilities www.hse.gov.uk/construction/healthrisks/welfare/toilets-and-washing.htm

Approved list of biological agents www.hse.gov.uk/pubns/misc208.pdf

Blood-borne viruses (BBV) <http://www.hse.gov.uk/biosafety/blood-borne-viruses/>

Other guidance

College of Policing <http://www.college.police.uk/Pages/Home.aspx>

Rare and Imported Pathogens Laboratory at Public Health England
<https://www.gov.uk/government/collections/rare-and-imported-pathogens-laboratory-ripl>

Acknowledgements

HSE gratefully acknowledges the help given by the following organisations during development of this guidance:

Association of Anatomical Pathology Technology

British Institute of Embalmers

British Institute of Funeral Directors

Coroners' Officers and Staff Association

Health Protection Scotland

Health and Safety Laboratory

Home Office Forensic Science

Human Tissue Authority

National AIDS Trust

National Association of Funeral Directors

National Health Service England

National Health Service Scotland

Public Health England

Royal College of Pathologists

HSE would also like to thank all of the organisations and individuals who made contributions during the consultation on this guidance.

Further information

For information about health and safety visit <https://books.hse.gov.uk> or <http://www.hse.gov.uk>. You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

To report inconsistencies or inaccuracies in this guidance email: commissioning@wlt.com.

British Standards can be obtained in PDF or hard copy formats from BSI: <http://shop.bsigroup.com> or by contacting BSI Customer Services for hard copies only. Tel: 0846 086 9001 email: cservices@bsigroup.com.

The Stationery Office publications are available from The Stationery Office, PO Box 29, Norwich NR3 1GN Tel: 0333 202 5070 Fax: 0333 202 5080. E-mail: customer.services@tso.co.uk Website: www.tso.co.uk. They are also available from bookshops.

Statutory Instruments can be viewed free of charge at www.legislation.gov.uk where you can also search for changes to legislation.