Guidelines for the Management of Deceased Individuals Harbouring Infectious Disease

Prepared by:
Management of Deceased Persons Harbouring Infectious Disease Sub-Committee for the Scientific Advisory Committee of the Health Protection Surveillance Centre, 2013

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FOREWORD

Respect for the dead is a value deeply ingrained in all societies, cultures and religions. This respect should not be compromised when a person dies from an infectious disease. However, it can be difficult to balance respect for the deceased person with the health and safety of those who come into contact with them. These guidelines are intended as a resource for those who strive to achieve this balance or are impacted by it: workers in the funeral industry, mortuary workers, health professionals, families of the deceased and the public.

The guidelines are based on the fact that infectious diseases in the living are potentially a greater hazard than such diseases in the dead. The adoption of Standard Precautions, the use of appropriate protective clothing and the observance of Health and Safety regulations, are the most important elements in the prevention of infection in both the living and the dead.

In drafting the guidelines, the Sub-Committee used an evidence based approach as far as possible to deal with this sometimes emotive subject. While there is a dearth of evidence specific to the handling of dead persons the significant amount of evidence that exists with regard to infection control in the living was utilised.

The Sub-Committee consulted widely and is particularly appreciative of the response to the public consultation which greatly assisted its deliberations. This ensured the guidelines have achieved the optimum balance between health and safety considerations, the management of risk, the preservation of confidentiality, respect for the deceased and their families and communication amongst health professionals, funeral directors and the bereaved.

The Sub-Committee, in reviewing the issues surrounding this topic, considered the most pressing priority to be the introduction of a system of regulation of the funeral industry, to ensure that the overall management of deceased persons is placed on a systematic and harmonised footing. This too was identified as an important priority by many respondents in the consultation process.

I would like to thank all of the members of the Sub-Committee for their invaluable contribution to the preparation of these guidelines and to acknowledge the work and commitment particularly of Ms Kirsty MacKenzie (Administrative Secretary), Dr Anne Dee (Medical Secretary) and Dr Paul McKeown, Consultant in Public Health Medicine, HPSC.

Dr Elizabeth Keane
Chair
Management of Deceased Persons Harbouring Infectious Disease Sub-Committee

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Recommendations

For the effective implementation of these guidelines, a number of essential actions must be taken. These form the basis of the following recommendations:

1. There should be government regulation of the professions of funeral directors and embalmers (Chapter 12.4).
2. Funeral directors and embalmers should be required to register with their regulatory body (Chapter 12.4).
3. Occupational health facilities should be available to all funeral directors and embalmers (Chapter 12.4).
4. Embalming should only be performed in premises which are suitable for the purpose and meet Health and Safety Regulation standards (Chapter 12.3).
5. Planning regulations should ensure that funeral premises are suitable for purpose, including the provision of embalming facilities (Chapters 12.3; 17.1).
6. Embalmers should be required to be trained to a suitable standard, eg that of the British Institute of Embalmers, before being allowed to register and/or practice (Chapters 12.4; 19).
7. As the use of body bags becomes routine for transport and containment of human remains, funeral directors and health care personnel should familiarise themselves with their indications for use, enclosure, transport and management of hygiene (Chapters 10, 11).
8. Standard Precautions for infection control should be implemented by anyone handling human remains (Chapter 5).
9. Funeral directors and their staff should all receive training in the use of Standard Precautions for infection control (Chapters 12.4; 19).

Chapter 1. Introduction

According to Central Statistics Office data, there are over 27,000 deaths annually in Ireland. It is estimated that less than 1% are associated with a known or suspected infection. For each death, the process of burial of the remains from the time of death to burial in Ireland is usually 2-4 days. During this time the body may be handled and/or viewed by loved ones, healthcare workers, and funeral staff at a minimum, and sometimes also by the Gardaí, emergency workers, pathology staff, mortuary staff, morbid anatomy workers and other workers likely to uncover human remains. Therefore, the handling of human remains involves many different individuals, and a variety of agencies, and responsibility for the safety of those handling remains does not rest with any one individual or department.

Risk of infection can be minimised by following good basic infection control precautions. It is worth noting that diseases in the living are potentially a far greater hazard to health than diseases in the dead, and increasing infection control precautions after death is not justified.

Not all cases of infection will have been identified before death and for this reason safety standards must be adopted for the handling of all bodies. The adoption of **Standard Precautions** is the single most important element in preventing the spread of infection from the deceased individual. These are routine precautions that minimise the risk of transmission of infection. They are based on the principle that most human secretions/excretions and non-intact skin can potentially harbour disease-causing micro-organisms. Standard Precautions include hand hygiene, wearing of personal protective equipment, and careful handling of sharp instruments. A detailed description of Standard Precautions is given in Appendix 6.

There are various situations in the process of handling and disposal of human remains that represent an increased risk of exposure to infection, and any process which may involve contact with body fluids, or the use of sharp instruments, especially the process of embalming, is associated with increased risk. The implementation of Standard Precautions is the most effective way of reducing this risk, and must be standard practice for all those involved. Those handling human remains must always be aware of the potential risk of infection posed, but due regard must also be given to the possible distress of grieving relatives.

The funeral industry in Ireland is unregulated, and because of this standards of hygienic practices and infection control procedures vary enormously. Because of the lack of regulation it is difficult to ensure that high standards are maintained in all cases. The availability of suitable embalming facilities is a subject of concern among those working in the funeral industry, and anecdotal evidence suggests that the process on occasion happens in very unsuitable premises, eg private homes, hospital chapels. In the interests of reducing the risk of transmission of blood borne and other infections to a minimum, standards must be set, and in order for these standards to be applied, regulation should be an urgent priority.

The need for guidelines for those involved in the handling of human remains has been recognised as an important step in beginning to address these issues, and with that in mind the Scientific Advisory Committee of the Health Protection Surveillance Centre (HPSC) appointed a sub-committee to draw up these guidelines. The guiding principles that underline these guidelines include health and safety considerations, risk, confidentiality, respect for the deceased and their families and communication amongst health professionals, funeral directors and with families.

The communication of disease status to funeral directors has not been common practice in the past. It has always been considered the best approach to maintain complete medical confidentiality and advise all coming in contact with human remains and body fluids (irrespective of disease status) to observe Standard Precautions at all times ensuring that staff had undergone training and had been offered all available countermeasures (such as vaccination). However, post-exposure prophylaxis is now available for Human Immunodeficiency Virus (HIV), hepatitis B and other pathogens which must be given within a short time after exposure. Because of this it has become more important to identify those human remains and specimens that pose a risk, and to find a way of communicating this risk effectively to those at risk. These guidelines outline the minimum standards essential to prevent the spread of infection. In drawing up the guidelines, the Sub-Committee used the approach of risk identification, assessment and risk management.

While there exists a large body of evidence with regard to infection control in the living, reviewing the literature reveals that very little evidence exists that is pertinent to handling of the deceased. The main body of evidence relates to the possible transmission of blood borne viruses, including hepatitis B, C and HIV, certain enteric pathogens and *Mycobacterium tuberculosis*. This document addresses these issues, stressing the overarching importance of the use of Standard Precautions (as outlined in Appendix 6) as the main element of infection prevention and control from the deceased to the living. Additional measures recommended are the universal use of body bags, protection of workers by vaccination where appropriate, and good hygienic practices based on use of Standard Precautions.

The recommendations that arise from this document are based on the deliberations of the Sub-Committee having reviewed best international practice.

This document is intended primarily for use by funeral directors and as a resource for health professionals who may have to communicate with funeral directors and bereaved families.

The Sub-Committee's terms of reference were as follows:

1. **To review international evidence of best practice on the risk of transmission of infections from deceased individuals harbouring or suspected of harbouring infectious diseases.**
2. **To prepare guidelines for the management of deceased individuals harbouring infectious diseases.**
3. **The guidelines should serve as a code of practice and provide guidance for mortuary workers; workers in the funeral industry; the public and families of the deceased and health professionals. The guidelines plan to cover the following areas:**

   • cadaver bags
   • embalming
   • viewing
   • laying out
   • exhumation
   • wakes
   • post-mortems
   • mortuary facilities
   • repatriation
   • communication
   • risk management incorporating risk assessment
   • responsibility / governance
   • protective clothing
   • Standard Precautions
   • hepatitis B vaccination
   • legislation

   The main pathways of transmission of infection should be described and the risks associated with the major categories of infection should be outlined.

Sub-Committee Membership

The membership of the Management of Deceased Persons Harbouring Infectious Disease Sub-Committee was as follows:

Dr Elizabeth Keane, Director of Public Health, HSE-South **(Chair)**

Dr Anne Dee, Specialist Registrar in Public Health Medicine, HSE-South **(Medical Secretary)**

Dr Tom Crotty, Consultant in Histopathology, St Vincent's University Hospital, Dublin (RCPI Faculty of Pathology)

Dr Robert Cunney, Consultant Microbiologist, Health Protection Surveillance Centre and Temple Street Children's University Hospital, Dublin

Ms Edith Daly, CNS Infection Prevention and Control, Our Lady's Hospital, Navan (Infection Prevention Society)

Mr Seamus Griffin, Funeral Director, Kirwan's Funeral Home, Dublin (Irish Association of Funeral Directors)

Dr Mary Horgan, Consultant in Infectious Diseases and General Medicine, Cork University Hospital (Infectious Disease Society of Ireland)

Mr Shane Keane (alternate Ms Dympna O'Grady), Senior Environmental Health Officer, Galway (Environmental Health Officers Association)

Dr Elizabeth Kenny, Consultant Hepatologist, Cork University Hospital (Consultative Council on Hepatitis C)

Mr Carl Lyon, Mortuary Technician, Dublin City Mortuary

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Dr Dominick Natin, Consultant Occupational Health Physician, Mater Misericordiae Hospital, Dublin (RCPI Faculty of Occupational Medicine)

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Ms Kirsty MacKenzie, Health Protection Surveillance Centre **(Administrative Secretary)**

Chapter 2. Spread of infection

Infection is a process which involves damage to body tissues as a result of activity of micro-organisms. The presence of micro-organisms does not always result in infection, and when infection does occur, it is usually accompanied by signs and symptoms, for example, pain, swelling, redness, and production of pus and/or fever.

Infection can be caused by

- bacteria
- viruses
- pathogenic fungi
- parasites
- prions

Infection can be spread by

- direct contact
- inhalation
- ingestion
- inoculation, eg by sharp objects such as needles and other sharp instruments, or bone or tooth fragments
- indirectly, eg by hands, aerosol spread or insect vectors

Infection in a dead body poses less risk than infection in the living and is most likely to be transmitted under the following circumstances:

- needlestick injuries with a contaminated instrument or sharp fragment of bone or tooth;
- intestinal pathogens from anal and oral orifices in the dead body;
- through and from abrasions or open lesions;
- contaminated aerosols from body openings or wounds, eg tubercle bacilli, when condensation could possibly be forced out through the mouth of the deceased;
- splashes or aerosols onto the eyes, mouth or nose of the person handling human remains.

The risks of infection are not high, and are not more than in life. They are usually prevented by the use of Standard Precautions, appropriate protective clothing and by the observance of Health and Safety regulations.

Chapter 3. Legislation

To ensure the safety of those involved in handling deceased persons, and those involved in doing various procedures on them, eg post-mortem examination, embalming, legislation is in place. Both the health and safety of workers, and protection of the general public and workers from the dangers of infection, are addressed. The purpose of these regulations is to ensure maximum protection for all involved.

There are two types of legislation relevant to the risk of spread of infection associated with the handling of deceased persons, and they include the following:

- Health and Safety legislation
- Infectious Disease legislation

3.1 Health and Safety legislation

Health and Safety legislation is intended to ensure that all workplaces and work practices are as safe as possible for everyone, whether undertaking work or merely being present in such an environment or during such practices:

The Safety, Health and Welfare at Work Act, 2005

Safety, Health and Welfare at Work (Biological Agents) Regulations 1994 [Amended by S.I. No. 248 of 1998]

Safety, Health and Welfare at Work (General Application) Regulations 2007 (S.I. No. 299 of 2007)

Employers have a duty to protect their staff from risks to safety, health and welfare while at work. When it is not possible to eliminate risk, the risk must be assessed and maximum protection provided against injury, eg the use of personal protective clothing/equipment (PPE), and/or vaccinations. The legislation also requires that employees comply with these regulations. There is also a duty to provide employees with adequate training in the use of Standard Precautions and PPE, and in the Standard Operating Procedures (SOPs) of the workplace. Adverse incidents must be reported and recorded.

The Health and Safety at Work (Biological Agents) Regulations of 1994 detail the precautions which must be taken when working with various biological agents. Biological agents are classified into four Hazard Groups, from 1 to 4, where 1 represents the lowest level of risk and 4 represents the highest level. A separate classification of 3(*) exists and is considered as high risk but "may present a limited risk of infection for workers because they are not normally infectious by the air-borne route". Included in this group are hepatitis B, C, E and HIV. The full list of biological agents is included in Appendix 4.

In the setting of the mortuary or funeral home, Health and Safety legislation requires protection for visitors as well as employees.

3.2 Infectious Diseases Legislation

Under the Health Act of 1947 are a number of amendments and additional regulations relevant to the handling of deceased persons with infectious disease. They include the following:

Statutory Instrument No. 390 of 1981 Infectious Diseases Regulations 1981

Statutory Instrument No. 707 of 2003 Infectious Diseases (Amendment) (No. 3) Regulations 2003

Regulation 12 of the Infectious Diseases Regulations 1981 states that "A medical officer of health shall take such measures as he may consider appropriate, or as the Minister may direct, with regard to the custody, transport and disposal of the body of a person which is a probable source of infection with an infectious disease".

The 2011 amendment includes a list of diseases which are currently notifiable in Ireland, and a full list is included in Appendix 3.

Chapter 4. Risks

Contact with human remains presents a hazard of developing infection, and there are various stages in the process of handling and disposal of human remains that represent an increased risk of this happening.

Micro-organisms have been classified into four Hazard Groups according to the Safety, Health and Welfare at Work (Biological Agents) Regulations 1994 (see Appendix 4) on the basis of pathogenicity to humans, risk to persons working with the micro-organism, eg laboratory workers, transmissibility to the community, and whether effective prophylaxis is available.

Hazard Group 1 - An organism that is unlikely to cause human disease.

Hazard Group 2 - An organism which can cause human disease and might be a hazard to employees, although it is unlikely to spread to the community and in respect of which there is usually effective prophylaxis or treatment available.

Hazard Group 3 - An organism which can cause severe human disease and presents a serious hazard to employees and which may present a risk of spreading to the community, though there is usually effective prophylaxis or treatment available.

Hazard Group 3(*) - Certain biological agents classified in Hazard Group 3 which are indicated in the list by an asterisk (*), may present a limited risk of infection for workers because they are not normally infectious by the air-borne route. As appropriate, some measures required by classification as Hazard Group 3 may be dispensed with within Hazard Group 3(*).

Hazard Group 4 - An organism which causes severe human disease and is a serious hazard to employees and which may present a high risk of spreading to the community and in respect of which there is usually no effective prophylaxis or treatment available.

There are risks associated with each stage of the handling and disposal of human remains:

1. Initial collection of remains
2. Transport of remains from initial collection point
3. Storage of remains prior to burial or cremation
4. Hygienic preparation or laying out
5. Post-mortem examination
6. Embalming
7. Domestic duties, eg cleaning of vehicles, removal shells
8. Laundering, cleaning instruments and disposal of waste
9. Exhumation

For each of these stages the risks are of exposure to potentially infectious material in body fluids, waste, or by direct skin contact. There can also be a risk of exposure to air-borne infections during any stage that involved manual moving of the remains. During exhumations the risks also include exposure to infectious materials in the soil.

Chapter 5. Standard Precautions for infection prevention and control

The use of Standard Precautions involves following a recognised set of guidelines which have been developed to ensure the maximum protection of those who work in healthcare settings from exposure to infection. In the case of those working with deceased persons, the protection of the living is the priority.

Since it is not possible to rule out an underlying infection in every case, the use of Standard Precautions in the handling of all human remains is of utmost importance, and is the most effective means of preventing the spread of infection.

Standard Precautions (see Appendix 6) are based on the principle that all blood, body fluids, secretions, excretions (except sweat), non-intact skin and mucous membranes may contain transmissible infectious agents, and the following are the most effective means of diminishing the risk of infection from these:

- Thorough hand hygiene, following any contact with a body or the immediate environment around a body.
- Hands should be cleaned with liquid soap and running water, and dried thoroughly with a clean towel. Alternatively, if hands are visibly clean, they may be decontaminated using an alcohol-based hand gel. Details of hand hygiene techniques can be found at http://www.hpsc.ie/hpsc/A-Z/Gastroenteric/Handwashing/.
- Disposable gloves must be used in the handling of all bodies (Note: hand hygiene is still required on removing gloves).
- In the case of mortuaries and funeral parlours, additional protective clothing beyond that required for Standard Precautions must be provided and used at all times. This includes waterproof aprons, gowns, gloves, overshoes or Wellington boots and appropriate eye protection. Face and eye protection includes face shield, or surgical mask and goggles, or mask with eye shield (see Appendices 7 and 9).
- Protective clothing should be removed after handling the body, disposed of appropriately, and hands washed thoroughly. Reusable personal protective equipment (PPE) should be cleaned and disinfected after each use in accordance with manufacturer's instructions.
- Spillages must be dealt with immediately after they occur (see Chapter 5.1).
- Sharp instruments and needles must be handled in accordance with the instructions in Appendix 8 to ensure the maximum protection from injury for those handling them.

5.1 Spillages

Spillages in hospitals should be dealt with as per hospital protocol. Outside of the hospital setting, all spills of blood or other body fluids should be cleaned up promptly. Protective clothing should be worn (gloves and plastic apron). Blood spills should be soaked up by using chlorine releasing granules* and disposable paper towels. The granules or towels should be scraped/soaked up and placed in a healthcare risk waste bag. The area should then be cleaned with a detergent solution and dried. For general cleaning of the environment, a good quality detergent and hot water is preferred. Appropriate spillage kits are readily commercially available, and all funeral and mortuary premises should have one. Staff should be trained in the correct use of these.

*NB: Chlorine is corrosive to metals and will react with formaldehyde. When chlorine releasing granules come into contact with urine – chlorine fumes may be released which may lead to respiratory problems. Chlorine releasing granules can only be used on small scale spillages of blood.

For further details of how to deal with spillages, refer to Appendix 10.

5.2 Cleaning of instruments

The following precautions need to be taken with the cleaning of instruments:

- Instruments used for post-mortem or embalming procedures must only be used for these purposes. They must not be re-used for procedures on living patients.

- Sharps used in post-mortem and embalming procedures should be single use and disposed of appropriately after use.
- The use of an automated washer disinfector to clean instruments is strongly recommended.
- Where instruments are being reused and an automated washer disinfector is not available, the following steps should be followed when washing instruments by hand:
  - Cleaning of instruments must be done in a dedicated sink (ie not a hand washing sink).
  - Appropriate PPE must be worn (including gloves, waterproof apron and eye protection (goggles or visor).
  - Instruments should be cleaned of debris in warm (not hot) water and detergent and soaked in a solution of an appropriate disinfectant, as outlined by the manufacturer.
  - Instruments should be kept fully immersed in the water/detergent solution while being cleaned, to avoid generating splashes or aerosols. Once cleaned, the instruments should be rinsed by immersing them in clean water.
- Instruments **must not** be sharpened by hand.

It is important to emphasise that there is a risk of injury to the user when washing instruments by hand and, again, the use of an automated washer disinfector is strongly recommended.

An example of an appropriate disinfectant is a 0.1% hypochlorite solution.

WHO recommend soaking in a 0.1% hypochlorite solution (ie 1 in 10 dilution of household bleach) in a plastic container (hypochlorite reacts with metal containers) for 10 minutes. This should be sufficient for routine mortuary work, embalming and most post-mortems. However, where there is a risk of CJD or other TSE, decontamination procedures should follow the recommendations of the Irish CJD guidelines, "Guidelines on Minimising the Risk of Transmission of Transmissible Spongiform Encephalopathies in Healthcare Settings in Ireland (2004)" (http://www.hpsc.ie/hpsc/A-Z/MicrobiologyAntimicrobialResistance/CJD/Guidance/). Other disinfectants may be appropriate for decontamination of surfaces.

Chapter 6. Management of sharps injuries/splashing injuries

In the course of handling a deceased person, an injury may be sustained. The risk of this happening is reduced to a minimum by the use of Standard Precautions. Injuries can result from:

- inoculation of blood by a needle, scalpel blade, suture needle or other sharp, eg bone fragment;
- contamination of broken skin with blood and body fluids;
- blood or body fluid splashes to mucous membrane, eg eyes or mouth;
- contamination where clothes have been soaked by blood or other body fluids.

6.1 Actions in the event of an injury

In the event of any penetrating or lacerating injury the following actions should be taken:

- gently encourage bleeding from the wound;
- wash the wound in soap and warm running water, but do not scrub the area;
- cover the wound with a dressing;
- in the event of splashing of blood or body fluid to skin, eyes or mouth: wash with plenty of water;
- ensure the sharp is disposed of safely;
- report the incident to supervisor immediately;
- attempt to identify source of the needle/sharp;
- person who sustained the wound should seek appropriate medical advice from the Occupational Health, Infectious Disease or Microbiology Department;
- where the above are not available, a person sustaining such an injury should present to the Emergency Department of their local hospital, or to their General Practitioner (GP);
- complete an accident report form, and record all information in the Incident Report.

It is the responsibility of Emergency Departments and GPs to ensure that they have proper protocols in place to deal effectively with such injuries.

In many cases the risk status of the body is unknown. If, in these cases, a sharps or splash injury occurs the actions should be the same as for known medium to high risk cases (see Chapter 7.3). If the body is identified as medium or high risk, or is infected with a disease in these categories, seek medical advice immediately. In some circumstances, eg exposure to HIV positive blood, treatment should ideally be given within the first two hours, and may be less effective thereafter. Failure to do so may result in seroconversion and subsequent disease. In the event of a sharps or splash injury occurring outside of the healthcare setting, a person sustaining such an injury should present to the Emergency Department of their local hospital. In the event of a sharps injury involving an inoculation from a contaminated instrument/bone or tooth fragment/needle, it is important that a donor sample be taken from the deceased person for testing. The position in relation to taking a sample from a deceased person is unclear. If consent from the next of kin is not forthcoming and in order to ensure the greatest level of protection to the person taking the sample, an application should be made to the Court for permission to take the sample.

Chapter 7. Communication of risk and confidentiality

These are the Guiding Principles regarding the management of confidentiality and associated issues in relation to deceased persons:

1. **Standard Precautions are the most effective method of preventing transmission of infection following death in the case of unknown pathogens and pathogens up to and including those in hazard groups 3 and 3(*)**

2. **Particular and special care must be taken in handling human remains infected or potentially infected with pathogens in hazard Group 4 and TSEs and it is crucially important that this information should be communicated to those who need to know**

3. **The Notification of Death form must always contain the contact details of the medical practitioner attending the deceased person to enable communication in the event of an injury occurring to person handling the deceased remains**

4. **Should a sharps or splash injury occur, there should be a rapid risk assessment enabling necessary actions as laid out in HPSC's Guidelines for the Emergency Management of Injuries (www.emitoolkit.ie)**

Should any member of staff working in a mortuary, embalmers or funeral home suffer a sharps or splash injury, they should seek immediate medical advice from their local Occupational Health Department, Emergency Department or General Practitioner, ensuring that that they bring with them the information and contact details contained in the Notification of Death form. Their medical advisor will then advise treatment/interventions along the lines laid out in the HPSC's guidance document *Emergency Management of Injuries* available at www.emitoolkit.ie.

7.1 When to communicate risk

As a general principle, confidentiality should be maintained after death.

The principle of medical confidentiality is a fundamental precept of medical practice enshrined in the Medical Council's document, *Guide to Professional Conduct and Ethics for Registered Medical Practitioners*. It states that "Confidentiality is a fundamental principle of medical ethics and is central to the trust between patients and doctors. Patients are entitled to expect that information about them will be held in confidence. [A Medical Practitioner] should not disclose confidential patient information to others except in certain limited circumstances…."

Section 24.2 of this document stipulates that "Patient information remains confidential even after death. If it is unclear whether the patient consented to disclosure of information after their death, you should consider how disclosure of the information might benefit or cause distress to the deceased's family or carers. You should also consider the effect of disclosure on the reputation of the deceased and the purpose of the disclosure."

The most effective way to minimise the risk of disease transmission, both ante- and post-mortem, is through **strict adherence to Standard Precautions** including the application of steps to minimise the potential for sharps injuries and other exposures. The use of Standard Precautions should be an essential requirement for **all** staff (clinical and non-clinical) handling **all** human remains. Most infections remain undiagnosed; hence it is **crucial that standard precautious are applied uniformly and in every case**.

In general, Standard Precautions will be sufficient when used to handle the remains of deceased individuals harbouring pathogens up to, and including, hazard group 3 or 3(*) (whether the risk of infection is known or unknown).

For pathogens in hazard group 4 (viral haemorrhagic fever viruses, variolae viruses) and transmissible spongiform encephalopathies, special precautions are required and post-mortems should only be undertaken in special, suitable facilities. Embalming should not be undertaken on human remains in such instances.

Although evidence is limited, what there is suggests that the risk of transmission of infection from human remains to attending individuals is likely to be low. Anecdotal evidence from US medical examiners suggests that "contracting an infection during the course of an autopsy was an exceedingly rare event."

The author provides personal anecdotal evidence of his experience of the likelihood of transmission during autopsies; "there was one case of hepatitis B in a pathologist and one case of tuberculosis in an autopsy assistant attributed to the performance of autopsies in a 25-year period during which an estimated 50,000 autopsies had been performed, and this was prior to the development of OSHA standards and hepatitis vaccines.[3]

Despite this, all human remains must be handled as if they are infected with a hazard group 3 or 3(*) pathogen. The specific diagnosis of the deceased must remain confidential, except when it is necessary to divulge this as part of a risk assessment following a sharps or splash injury or other significant exposure involving human remains known to be infected with hazard group pathogens 3, 3(*), 4 and TSEs.

For this reason, it is crucial that the attending physician's contact information **must** be available on the Notification of Death form of **every death** to enable an appropriate and timely risk assessment (see Sect. 7.3 "How risk should be communicated" below), should this event occur. In the event of an injury as described above, the protocols to be followed are laid out in the HPSC's guidance document *Emergency Management of Injuries*.

In the interests of infection control, all staff should use Standard Precautions as a matter of course, treating all human remains as though potentially infected. In the event of death in hospital or in a nursing home, these include:

- Appropriate ward staff
- Mortuary staff
- Funeral directors/embalmers
- Pathologist

Where the death takes place at home, the following should also use standard precautions:

- Nurse (or other) laying out the body
- Undertakers/embalmers
- Medical examiners

Because of the risk potentially posed by human remains, Standard Precautions must be used when handling all bodies.

7.2 Communication of level of risk

- The specific diagnosis (except in the case of hazard group 4 pathogens and TSEs) should remain confidential to all (apart from the relevant medical practitioner) except in event of a sharps or splash injury (see below).
- In cases of hazard group 4 infections and known or suspected Transmissible Spongiform Encephalopathy (TSE), it is imperative that the pathologist and funeral director be informed of the hazard group categorization and that this body poses a significant health risk and embalming should not be carried out.
- For hazard group 4 infections, and TSEs, post-mortem examination should only be performed in a category A post-mortem facility, if at all.
- In all other categories of infection, including hazard group 3 and 3 (*), the use of Standard Precautions provides adequate protection against the spread of infection, and as the infectious risk of some bodies will not be known at the time of death, the use of Standard Precautions should be an essential requirement for **all** those handling **all** human remains.

- If this is combined with the limitation of performing embalming only in suitable facilities, (see Section 16), the risk of the spread of infection from human remains will be reduced to a minimum.
- Should a sharps or splash injury occur, the risk should be assessed on a case-by-case basis.

7.3 How risk should be communicated

The Notification of Death form **must** always contain the contact details of the attending physician and is a suitable conduit for the communication of the level of risk (in the case of pathogens in hazard group 4 and TSEs) to funeral directors and embalmers.

The standard Notification of Death Form should be used which will include the following information:

- Whether or not embalming should be permitted on the body
- The level of risk presented by that particular body if in hazard group 4 and TSEs.
- The attending physician's urgent contact details should be clearly noted on the form so that, in the event of a sharps or splash injury occurring while funeral staff have been working on the remains, further information can be rapidly sought from the attending physician as part of the initial rapid risk assessment as laid out in the HPSC's Guidelines for the *Emergency Management of Injuries*.
- Details of which diseases fall in hazard group 3, 3(*) and 4 should be on the back of the forms, for the information of the doctor who will be filling in the form
- A Notification of Death Form should be filled by a doctor in the case of all deaths, and a copy given to, and retained by the funeral director.
- All funeral directors should have details on their premises of their local occupational health facility (or if this is not available, their local Emergency Department or GP as described in section 6.1).

1. Medical Council. *Guide to Professional Conduct and Ethics for Registered Medical Practitioners*. Dublin, 2009. Available at http://www.medicalcouncil.ie/Information-for-Doctors/Professional-Conduct-Ethics/The-Guide-to-Professional-Conduct-and-Ethics-for-Registered-Medical-Practitioners.pdf. Accessed 14/1/2013.

2. The circumstances stipulated by the Medical Council in which a Medical Practitioner may disclose confidential patient information include: a) Disclosure with patient's consent to relatives and carers; b) Disclosure required by law; c) Disclosure in the interest of the patient or other people; d) Disclosure in the public interest and e) Disclosure to other healthcare professionals. Further information is available from Further information is available from *Guide to Professional Conduct and Ethics for Registered Medical Practitioners.*

3. Wetli, C V. Autopsy Safety. *Laboratory Medicine.* 2001, 8(32); 451-3. Available at http://labmed.ascpjournals.org/content/32/8/451.full.pdf. Accessed 14/1/2013.

4. For further information please see HPSC's Guidelines for the Emergency Management of Injuries (available at www.emitoolkit.ie).

Chapter 8. Laying out

After death, certain procedures are routinely carried out in the hospital/healthcare setting which demonstrate respect for the deceased person, and sometimes also focus on fulfilling religious and cultural beliefs and obligations. While these procedures are being carried out, attention must also be given to the health and safety of, and legal requirements to protect staff and relatives. **Where there is a perceived conflict of interest between these two aspects, the attention to health and safety of staff and relatives must always take precedence.**

'Laying out' includes the practice of 'hygienic preparation', or 'last offices' and various other rituals performed by different ethnic groups in the period immediately following death. These practices may be of extreme importance in some religions and inability to carry them out may result in severe distress to the bereaved. It is difficult to justify an increased level of precaution on handling a loved one after death than when they were alive, and sensitivity is important.

If pulmonary TB is suspected, a simple surgical mask should be used to cover the mouth and nose of the deceased person during movement of the body.[1,2]

8.1 Death in a healthcare setting

When a death takes place in a healthcare setting, the following should apply:

- As there is an increased risk of leakage of body fluids in those who are deceased, Standard Precautions and appropriate additional PPE where necessary, eg gloves and apron (and/or goggles if deemed necessary) should be used when handling all human remains.
- The deceased must be placed in a body bag prior to transportation to the mortuary.
- Hygienic preparation includes washing of the face and hands, closing the mouth and eyes, tidying the hair and in some cases shaving the face. In some cultures, the relatives may request that this is not done, or may wish to do it themselves. In the case of infection risk, the risk must be assessed, and if preparation by the relatives is allowed, it may need to be supervised by the funeral director, and the use of PPE by the relatives ensured. For infectious diseases in Hazard Group 4, the risk is categorised as high and no hygienic preparation should take place.
- The nursing staff, or care assistants, may perform plugging of orifices to prevent discharge, although the routine use of body bags for transport of human remains may eliminate the need for this. This is not permitted for infectious diseases in Hazard Group 4.
- Any wounds should be covered, and, unless a post-mortem is required, all drains, catheters and intravenous lines should be carefully removed, and any drainage sites covered with a dressing. This is not permitted for infectious diseases in Hazard Group 4.
- The funeral director will usually remove any implanted medical devices, eg pacemakers or defibrillators. These should be placed in a sharps container and returned to the hospital for disposal. The removal of such devices is not permitted for Hazard Group 4 infectious diseases but the funeral director must be warned that cremation cannot then be carried out because of the risk of explosion.
- In cases that are being referred to the coroner, medical devices may need to remain in situ.

In addition, there are specific restrictions that pertain to infectious diseases in Hazard Group 4 (Appendix 5).

8.2 Death at home

When a death takes place in the home, the procedure for laying out the deceased may be less clear. The following are intended as a guide to funeral directors in managing human remains at home:

- Any infection control procedures that have been advised before death must be continued in handling the deceased person after death.
- Funeral directors must use Standard Precautions in all cases.
- The funeral director should receive necessary information as in Chapter 7.1 in order to advise the family about avoiding any possible infectious risk.
- If the body is being transported from the home it may be placed in a body bag. If the deceased is not being moved from home and there is no known infection risk then use of a body bag will not be necessary.
- The funeral director will then advise the family on handling the body during the laying out procedure.
- If the funeral director or family are unclear on what to do they can contact their local Department of Public Health (See Appendix 2).

1 Young SEJ, Healing TD, (1995), Infection in the deceased: a survey of management, *CDR Rev*, **5**, R69-73
2 Burton JL, (2003), Health and safety at necropsy, *J Clin Pathol,* **56,** 254-60

Chapter 9. Waking

Traditionally in Ireland a deceased person was waked at home. This involved keeping the deceased person in their home during the interval between death, or release of the body from the hospital, and the burial. It is usual in Ireland to have a church service before the burial. The wake gives time for the family members to grieve the loss of the loved one, and it enables relatives and friends to express their condolences in the less formal atmosphere of the family home. The usual period for a wake is between one and two days. In recent times, there is an increasing trend back to the traditional wake, and away from the funeral home.

It is important that during this time, infection risks are also reduced to a minimum, and Standard Precautions (See Appendix 6) must be followed to ensure that the body does not pose a risk of infection to the family, or the general public.

9.1 Embalming

The purpose of embalming is to cleanse, temporarily preserve and maintain a lifelike appearance of the deceased. This should be done in suitable premises as described in Chapter 17, and should never be performed in private homes or other unsuitable settings.

9.2 Temperature

If a body is being waked at home, the heating should be turned off in the room. The room must be adequately ventilated.

Chapter 10. Body containment

Historically, there has been some stigma attached to the use of body bags, and bereaved relatives may have considered that their loved one was being identified as an infection risk. However, the use of body bags is a practical measure to facilitate lifting and moving. Their use is also a hygienic measure to prevent leakage, and can contribute to infection control. Therefore, it is advisable that the use of body bags should be considered for all bodies, regardless of infection status.

The following principles should underpin the use of body bags:

- Body bags are for single use and are not re-usable.
- There are many types of body bag available, but it is recommended that those made of polyvinyl chloride should not be used if the body is to be cremated because of the risk of dangerous emissions of dioxins (alternatives are available).
- Body bags with a three-sided zip are the most suitable for use.
- For viewing of the deceased, the body bag can be opened and folded back so it is not visible.
- In the case of children (especially if the risk of infection is low or not known) or where adults are being waked at home, following an assessment of the risk of infection, alternative measures may be put in place. The use of body bags is not practical for neonates.

Chapter 11. Transportation of human remains

It is advisable that bodies should be placed in the body bag prior to moving, as this facilitates lifting, and reduces the risk of infection to a minimum.

Removal shells and any other equipment used in the transport of deceased persons should be made from washable material, and be suitable for cleaning with an appropriate detergent. They must be washed after each use, and if there is any visible contamination, should be disinfected.

Chapter 12. Embalming

12.1 The process

Embalming is a process of cleansing and temporarily preserving bodies after death. In addition, embalming helps to maintain a lifelike appearance of the deceased. As far back as the ancient Egyptians, people have used oils, herbs and special body preparations to help preserve the bodies of their dead. Yet no process or products have been devised to preserve a body in the grave indefinitely.

Modern embalming now consists primarily of removing all blood and gases from the body and the insertion of a disinfecting fluid. Small incisions are made in either the carotid or femoral artery and the jugular or femoral vein; the disinfecting fluid is injected through the carotid or femoral artery, and the blood is drained from the jugular or femoral vein.

If an autopsy is being performed, the vital organs are removed and immersed in an embalming fluid, and then replaced in the body, often surrounded by a preservative powder. If an autopsy is not performed, the embalmer aspirates fluids out of the body cavity by making a small incision near the navel and aspirating the bodily fluids.

This process presents the greatest risk of exposure to infectious micro-organisms by those involved in the disposal of human remains. This is because it involves direct contact with the body, exposure to blood and other body fluids and the use of sharp instruments.

12.2 When prohibited

Embalming must not be carried out on those who have died from certain (Hazard Group 4) diseases, and also from Transmissible Spongiform Encephalopathy. A full list of these diseases is included in Appendix 4.

12.3 Premises

Embalming should only be performed in premises which are suitable for the purpose and meets Health and Safety Regulation standards (as described in Chapter 17). Examples of suitable premises would include **suitably designed** hospital mortuaries, or funeral premises. Shower and wash facilities should be available on the premises, and should be used by staff if any contamination has occurred during the embalming process.

12.4 Embalmers

Persons who undertake embalming should fulfil the following criteria:

- Embalming should only be performed by a suitably trained and qualified embalmer.
- The training should be accredited. Currently this is provided by the British Institute of Embalmers.
- Embalmers should also be required to attend regular on-going education and training.
- Training should include a full explanation and education in the use of Standard Precautions (See Appendix 6).
- All embalmers should be vaccinated as described in Chapter 20.
- Embalmers should only work out of suitable premises, as described in Chapter 17.
- There should be government provision of a system of regulation for embalmers. They should be regulated by an appropriate regulatory body.
- Embalmers should be required to register with such a regulatory body before being allowed to practice.
- Embalmers should have full access to occupational health advice, including risk assessment and intervention if necessary.

12.5 Personal Protective Equipment (PPE)

When embalming is being performed, Standard Precautions must be followed and additional protective clothing worn.

For full details of the protective clothing necessary for carrying out the procedure, please refer to Appendix 9.

Chapter 13. Viewing

Only in the case of some Hazard Group 4 infections should viewing of the body be forbidden, in order to protect the health of relatives and funeral home staff. A list of these is included in Appendix 5.

Increasingly human remains are being contained and enclosed using body bags (See Chapter 10). As their use becomes routine, and not just when there is a known or suspected infection, it is important that the exact level of risk is communicated. In most cases this will be very low, and should not interfere with the families' wishes in the preparation and viewing of the deceased person. This, however, needs to be communicated to the family and funeral directors in order to avoid unnecessary distress to the bereaved.

In cases of infection risk from diseases in Hazard Group 3 and 3(*), those who wish to view/kiss the body can be allowed to do so, provided there is no risk of exposure to leaked body fluids. In these cases, the body bag will be opened and folded back so that it is not obtrusive, leaving the head, shoulders and arms exposed.

Chapter 14. Post-Mortem examinations

If a post-mortem examination is necessary, this should be done in suitable premises (see Chapter 17) by a suitably qualified pathologist in accordance with Royal College of Pathologists' guidelines.[3]

3. Guidelines on autopsy practice, Report of a working group of The Royal College of Pathologists, Sept 2002.

Chapter 15. Vehicles

The following points are intended as a guide to construction, management and upkeep of vehicles used to transport human remains:

- All removal vehicles should carry a supply of boots, overalls, gloves and body bags. They should also be equipped with first aid kit, antiseptic hand wash and masks.
- The vehicle should be roadworthy and fit for purpose.
- They should carry equipment and materials to clear away and deal with any spillages.
- The interior of the vehicle should be constructed so that it can be thoroughly washed and disinfected whenever it becomes contaminated with body fluids.
- Removal shells must be constructed in a material that prevents leakage of body fluids and should be washed after each use and disinfected if necessary.
- All other equipment used in the removal of bodies should be of a washable material and washed and disinfected if visibly contaminated.
- Removal vehicles should be dedicated for that purpose, and not used for any social or domestic purposes.
- Food is not to be transported in, or consumed in the removal vehicle, and smoking is not permitted inside the vehicle.
- A receptacle for placing contaminated gloves after removal should also be in place in the vehicle.

Chapter 16. Exhumations

16.1 Old interments

Ancient remains are occasionally disturbed and may need to be re-interred, or, if of archaeological interest, excavated and removed for further study. The risk posed by such remains is minimal, and most infectious agents will not survive for prolonged periods following burial. It is possible that some risk may be posed by anthrax, which can exist in the form of highly resistant spores. Another theoretical risk may be posed by smallpox, but although the virus can be identified in human remains which have been interred up to 100 years, it has not been possible to grow these organisms. The main risk posed to those who excavate old graves or crypts is from inhalation of lead dust and coffin wood dust. The risk of these is much higher among those excavating old crypts, and in this situation FFP3 or N99 masks should be worn, which will then also protect against infection by smallpox or anthrax. Additional protective equipment which should be worn in these situations includes overalls, head covering, safety helmet, gloves, and face shield.

16.2 Recent interments

Exhumation of more recent remains is sometimes required. The majority of micro-organisms will not survive longer than six months following interment, but if the deceased has had a transmissible spongiform encephalopathy, eg Creutzfeldt-Jakob disease (CJD), the causative organism may persist for a prolonged period.

16.3 Licence

A person shall not exhume from a burial ground the body of a deceased person save under a licence granted under Section 46 of The Local Government (Sanitary Services) Act, 1948 (as amended by the Local Government Act, 1994) or pursuant to an order of the Minister for Justice under section 15 of the Coroners (Amendment) Act, 1927 (No. 1 of 1927). The Rules and Regulations for the Regulation of Burial Grounds 1888 introduced under Section 181 of the Public Health (Ireland) Act 1878 should also be referenced (where relevant) when considering an application for a licence to carry out an exhumation.

A licence may be obtained by applying to the relevant Local Authority. All conditions attached to the licence must be adhered to. The Local Authority requests a certificate from the Health Services Executive that the exhumation can be carried out without danger to public health or breach of public decency. Conditions may be attached to the licence when granted, and all these must be adhered to. (Consideration should be given to matters such as the cause of death, reason for exhumation, length of time of present interment, location of the grave, soil type, etc.)

16.4 Supervision

Exhumations and reinterment must be carried out under the supervision of an Environmental Health Officer. The number of persons who attend an exhumation should be limited in the interest of public health, due care and decency (essential personnel only until the coffin is taken out and placed in the outer coffin).

16.5 First aid

A properly equipped first aid box must be available on-site and any cuts/lacerations received in the process of exhumation should receive immediate attention. Workers should cover all cuts and abrasions.

16.6 Facilities

The exhumation site should be completely concealed from the view of the public during the entire operation and ideally carried out at a time when the public is less likely to be accessing a graveyard. Arrangements in this regard should be made with the funeral director prior to the event.

Under normal circumstances, a large outer coffin of sufficient dimensions should be provided to enclose the coffin to be exhumed. The outer coffin should be lined with Visqueen®, or other suitable alternative impervious membrane to prevent escape of any liquids.

In the event of a water logged grave area, consideration needs to be given to additional precautions if pumping of the grave space is required, and the subsequent proper disposal of the pumped water. The Environment Section of the Local Authority should be consulted in this regard.

Washing and decontamination facilities should be provided on-site when exhumations are being carried out. These can be portable if necessary.

16.7 Protective clothing

Those carrying out exhumations need to wear protective clothing consisting of:

- heavy duty overalls
- waterproof trousers and jacket
- working boots with toe and sole protection
- waterproof heavy duty gloves
- hard hat (helmet)
- face visor in cases where there might be splashing

In addition, if carrying out exhumations in a crypt, respiratory protective equipment (RPE) should be used. It is important to ensure they are ventilated and have enough oxygen in them before allowing workers in.

RPE may also be needed if working in the open where the deceased has been known to have had tuberculosis or other such respiratory pathogen.[4]

16.8 Disinfectants

Disinfectants should be provided for disinfecting and deodorising purposes.

4. Controlling the risks of infection at work from human remains: A guide for those involved in funeral services (including embalmers) and those involved in exhumation, Health and Safety Executive, UK.

Chapter 17. Premises

There are specific instructions in the Health and Safety at Work (Biological Agents) regulations with regards to premises, and containment measures pertaining to infectious agents in Hazard Groups 2-4. These requirements can only be fulfilled in a specifically designed mortuary.

17.1 Mortuary, post-mortem facilities and embalming rooms

The design of these facilities must include consideration of the health and safety of the staff who will work in them, and of any members of the general public who may use them. The UK Health and Safety Executive,[5] and National Health Service[6] have issued guidelines for safe working in mortuary and post-mortem rooms, and their recommendations include the following:

- The building must be of adequate size to provide for storage of the maximum anticipated numbers of bodies, including any extra storage of bodies that may be required around public holidays.
- The work space should be divided into clean, dirty and transition areas, the transition area being the area which divides the two.
- The dirty area is to include areas where bodies are held, post-mortems are carried out and the disposal of soiled protective clothing and other soiled materials.
- The clean area should include all administrative areas, material storage, offices and the public viewing area.
- The transition area should be the area between these two areas, and should be clearly demarcated either by marking on the floor, or by a physical barrier. This area should include washing, showering and changing facilities.
- SOPs for each individual facility should specify the arrangements for the different areas within that premises, and the placing of notices to identify each area, especially the transition area, is good practice.
- Floor surfaces should be fit for purpose, and able to withstand wear and tear, and cleaning by disinfectant. They should be impervious and non-slip and the surface should be even. Coved edges facilitate cleaning, and there should be a slight slope towards gullies and drains to facilitate drainage.
- Ventilation should be adequate to deal with odour, and airflow systems should be designed such that airflow into the mortuary is at a high level, and out of the mortuary is at a low level.
- An appropriately located staff rest room is required, which has no connection with any dirty area, and separate food storage/preparation areas may be required.

17.2 High risk post-mortem facilities

A high risk post-mortem is defined as one which is being performed on a person who has died from a Hazard Group 4 infectious disease or a known or suspected TSE. They should be performed in a dedicated Grade A post-mortem facility.

5. Health Services Advisory Committee, Safe working and the prevention of infection in the mortuary and post-mortem room, 2003, Her Majesty's Stationery Office.
6. HBN 20 Facilities for mortuary and post-mortem services, NHS Estates

Chapter 18. Waste Disposal

All waste generated from the mortuary or embalming room is potentially infectious and should be dealt with as risk waste. Staff that generate risk waste have a duty of care to ensure that it is correctly segregated, sealed and stored and disposed of appropriately, through a licensed agent. Anything that has been contaminated by body fluids should be sealed as risk waste.

Body fluids and other contaminated liquids may be discharged into the drainage system.

Liquid products from the management of human remains should not be allowed to drain into surface water, and working sinks in the mortuary and embalming room should be connected to the sewerage system. Enzyme traps should be attached to drains. Under Jewish law, any body fluids removed after death need to be buried with the body rather than disposed of separately and this should be complied with in as much as is possible in line with Standard Precautions.

More detailed information is available from the Segregation Packaging and Storage Guidelines for Healthcare Risk Waste - 3rd edition available at http://www.dohc.ie/publications/segregation_packaging.html.

Chapter 19. Training

For those working in the funeral industry, including funeral directors and embalmers, it is the responsibility of the employer to ensure that training is provided in all of the following areas where appropriate:

- Standard Precautions
- standard operating procedures (SOPs)
- manual handling and lifting

Training must be certified, and records of training must be kept. Training should be provided at induction, and it should also be provided in the event of a transfer or change of task and when new work equipment, systems of work or new technology is introduced. Training should be repeated periodically, as per the relevant legislation.[7] It is the responsibility of the employer to ensure that this applies to all staff, including external contractors, eg, maintenance workers, funeral directors, embalmers.

7. Safety, Health and Welfare at Work Act 2005

Chapter 20. Vaccinations

According to the Health and Safety at Work Regulations employers are obliged to provide immunisation to protect staff where an infection risk exists.

All staff must ensure their immunisations are up to date and in accordance with the guidelines of the National Immunisation Advisory Committee.[8] These can be seen on the HPSC website at http://www.hpsc.ie/hpsc/A-Z/VaccinePreventable/Vaccination/Guidance/.

Those handling human remains should be protected against:

- **Tetanus:** a minimum of five doses of tetanus toxoid vaccine is required. Primary immunisation (three doses) is normally completed in early childhood, followed by at least two reinforcing booster doses; the first booster dose (fourth dose) is usually given 3-5 years later and the second booster (fifth dose) at least five years after the first booster. An additional booster dose may be required in fully vaccinated individuals with wounds if more than 10 years have elapsed since the last dose.
- **Poliomyelitis:** A full course should have been received as a child and, generally, no further boosters are required. No adult should remain non-immunised against poliomyelitis.
- **Tuberculosis:** All mortuary and embalming staff should be offered BCG vaccination, if they are unvaccinated and Mantoux-negative.
- **Hepatitis B:** It is recommended that all staff should receive a full course of immunisation against hepatitis B. The basic schedule consists of 3 doses of vaccine at 0, 1 month and 6 months. Then 2 months after the final injection it is necessary to have a blood test to confirm that antibodies to hepatitis B have been produced. Those **not** immune should be counselled. They should be advised of the continuing risk of infection and to seek specialist occupational health advice. (For further details please refer to the Immunisation Guidelines for Ireland and /or the website of the National Immunisation Office at www.immunisation.ie)
- It is the responsibility of the employer to ensure that their staff are offered vaccination.
- Assessment regarding need for vaccination for other vaccine preventable diseases should be done, eg measles, mumps, rubella, diphtheria. Vaccination should be given if appropriate (either booster or primary course).
- In some settings, additional vaccinations may be considered, eg hepatitis A, or occasionally, in specialist settings, meningococcal vaccination.

Although vaccines can give good protection against polio virus, tuberculosis and hepatitis B, the protection is **not** 100% effective and there are other infections against which there are no vaccines, eg HIV and hepatitis C. The use of Standard Precautions for infection control is therefore crucial in preventing cross infection.

In the event of exposure to tuberculosis infection, prompt public health follow up is required, in accordance with national guidelines[9] and legislation, regardless of BCG status.

8. Immunisation Guidelines for Ireland, (2008 ed), National Immunisation Advisory Committee, Royal College of Physicians of Ireland.
9. TB Advisory Committee, Health Protection Surveillance Centre (2010) *Guidelines on the Prevention and Control of Tuberculosis.* Health Protection Surveillance Centre, Dublin.

Chapter 21. Repatriation/Expatriation

It is important that any movement of bodies should be coherent with International Health Regulations (IHR).

The International Air Transport Association (IATA) has guidelines for the transport of human remains[10] which state that cremated human remains pose no risk of infection and may be handled and loaded as normal cargo on an aircraft.

Otherwise, human remains must be contained in a hermetically sealed inner coffin of lead or zinc inside a wooden coffin.

The wooden coffin may be protected from damage by an outer packing and covered by canvas or tarpaulin so that the nature of its contents is not apparent.[6]

In order to transport human remains a death certificate is required, and the body must not be an infection risk. If the deceased has had a communicable disease, their remains will be classified under IATA regulations as an "infectious substance". There are two categories of infectious substance, A and B. Category A includes highly infectious agents, eg Lassa, Ebola, Marburg, and Category B includes such infections as HIV. Strict packaging rules apply to the transport of specimens considered to be Category A or B infectious substances. Coffins, as described in AHM 333[10] above, do not meet these requirements. Therefore, a special permit needs to be issued by the Irish Aviation Authority and probably also (depending on the countries involved) from the countries of transit and destination. As it is very unlikely that such a permit would be issued for the sole purpose of repatriating human remains, it is considered that cremation is the only viable option for such cases. This may not be acceptable to families for a variety of reasons.

There is no regulation or requirement that human remains must be embalmed.

Some issues remain around the transportation of those who die from, or with, Category B infections. It is considered that the risk of infection from such a body, which is enclosed in a body bag and placed in a lined coffin, is negligible. Furthermore, if such remains have been embalmed, the risk is even further reduced by the removal of blood and its replacement with a disinfectant solution. It is therefore the opinion of this committee that such remains should be considered free of infection, and not subjected to specialist packaging rules.

10. IATA Airport Handling Manual, p 149, AHM 333 Handling of Human Remains.

Chapter 22. Responsibilities and Contacts

Regulation 12 of the Infectious Diseases Regulations 1981 states that '(a) medical officer of health shall take such measures as he may consider appropriate, or as the Minister may direct, with regard to the custody, transport and disposal of the body of a person which is a probable source of infection with an infectious disease.'

The Medical Officer of Health (MoH) role is carried out by the Director of Public Health for the area, and in cases of uncertainty, the local Department of Public Health should be contacted for advice. A full list is found in Appendix 2.

Advice can also be sought from the Health Protection Surveillance Centre (HPSC):

Health Protection Surveillance Centre
25-27 Middle Gardiner Street
Dublin 1
Tel no: 01 876 5300
Fax no: 01 856 1299
Email: hpsc@hse.ie

The Health and Safety Authority can also give advice:
Health and Safety Authority,

Head Office:
The Metropolitan Building
James Joyce Street
Dublin 1
Locall: 1890 289 389

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5. Health and Safety Executive (2003) *Safe working and the prevention of infection in the mortuary and post-mortem room.* Health Services Advisory Committee, Health and Safety Executive, UK.

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8. National Immunisation Advisory Committee, Royal College of Physicians of Ireland (2008 ed) *Immunisation Guidelines for Ireland*. Royal College of Physicians of Ireland, Dublin.

9. TB Advisory Committee, Health Protection Surveillance Centre (2010) *Guidelines on the Prevention and Control of Tuberculosis.* Health Protection Surveillance Centre, Dublin.

10. IATA IATA Airport Handling Manual, AHM 333 Handling of Human Remains. P149.

11. Health and Safety Authority (2008) *Guidelines on First-Aid at Places of Work.* Health and Safety Authority, Dublin.

12. Government of Ireland (2003) *S.I. No. 707/2003: Infectious Diseases (Amendment) (No. 3*) Regulations, 2003. Stationery Office, Dublin.

13. SARI Infection Control Subcommittee (2005) *Guidelines for Hand Hygiene in Irish Health Care Settings*. HSE Health Protection Surveillance Centre, Dublin.

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Government of Ireland (1998) *S.I. No. 248/1998: Safety, Health And Welfare At Work (Biological Agents) (Amendment) Regulations, 1998.* Stationery Office, Dublin.

Government of Ireland (2003) *S.I. No. 707/2003: Infectious Diseases (Amendment) (No. 3) Regulations, 2003.* Stationery Office, Dublin.

Glossary of Terms

BCG vaccine: A vaccine against tuberculosis which involves the sub-dermal injection of a small amount of an attenuated (weakened) bacterium called Bacille Calmette-Guérin, after the two French scientists who invented it.

Body bag: A bag made from plastic, normally white in colour that a body is placed in before being put in a coffin/ removal shell.

Disinfectant: An agent which reduces the number of viable micro-organisms on a surface or object, but which may not necessarily inactivate some viruses and bacterial spores.

Hazard: A source of danger or risk.

Laying out: Preparing a body for burial, may involve different practices for different ethnic groups.

Pathogenic: Capable of causing disease or damage to tissues.

Prions: An infectious agent made up only of protein.

Removal shell: A coffin made from hard plastic, usually grey or brown in colour, which normally has six handles on the side for carrying. It is used for transportation purposes only.

Removal vehicle: Any vehicle used for the purposes of transporting dead bodies, most usually a hearse, but also including designated ambulance and other types of vehicles, eg suitable army vehicles.

Risk: A chance or possibility of danger, loss, injury or other adverse consequence occurring.

Seroconversion: The process whereby a blood test goes from giving a negative to a positive result as a result of infection or vaccination.

Standard Precautions: These are routine precautions that minimise the risk of transmission of infection. They are based on the principle that most human secretions/excretions and non-intact skin can potentially harbour disease-causing micro-organisms. Standard Precautions include hand hygiene, wearing of personal protective equipment, and careful handling of sharp instruments.

Waking: A time of watching beside a person before burial, and the social interactions involved in this process.

Appendix 1[11]: First-aid equipment and Supplies

1. Different work activities need different provisions

Different work activities involve different hazards and therefore different first aid provision is required. Some places of work (eg offices, libraries) have relatively low hazards whereas others (eg factories and construction work) often have a greater degree of hazard or specific hazard involved. Requirements for first aid provision at work will therefore depend on several factors including the size of the workplace, the numbers employed, the hazards arising, access to medical services, dispersal of employees, employees working away from their employer's premises, workers in isolated locations etc. All of these issues will be described in the following sections.

As a minimum every workplace should have an occupational first aid box or kit. The following Table 1 (and the commentary on specific points which follows it) gives a broad indication of the type of first aid materials/equipment and supplies which would be reasonable in different circumstances.

2. Recommended contents of occupational first aid boxes and kits

Table 1: Recommended Contents of Occupational First Aid Boxes and Kits

Materials	First Aid Travel Kit Contents	First Aid Box Contents		
		1-10 persons	11-25 persons	25-50 persons*1
Adhesive Plasters	20	20	20	40
Sterile Eye Pads (No. 16) (bandage attached)	2	2	2	4
Individually Wrapped Triangular Bandages	2	2	6	6
Safety Pins	6	6	6	6
Individually Wrapped Sterile Unmedicated Wound Dressings Medium (No. 8) (10 x 8cms)	1	2	2	4
Individually Wrapped Sterile Unmedicated Wound Dressings Large (No. 9) (13 x 9cms)	1	2	6	8
Individually Wrapped Sterile Unmedicated Wound Dressings Extra Large (No. 3) (28 x 17.5cms)	1	2	3	4
Individually Wrapped Disinfectant Wipes	10	10	20	40
Paramedic Shears	1	1	1	1
Examination Gloves Pairs	3	5	10	10
Sterile water where there is no clear running water*2	2x20mls	1x500mls	2x500mls	2x500mls
Pocket Face Mask	1	1	1	1
Water Based Burns Dressing Small (10x10cms)*3	1	1	1	1
Water Based Burns Dressing Large*3	1	1	1	1
Crepe Bandage (7cm)	1	1	2	3

Notes

*1: Where more than 50 persons are employed, pro rata provision should be made.

*2: Where mains tap water is not readily available for eye irrigation, sterile water or sterile normal saline (0.9%) in sealed disposable containers should be provided. Each container should hold at least 20ml and should be discarded once the seal is broken. Eye bath/eye cups/refillable containers should not be used for eye irrigation due to risk of cross infection. The container should be CE marked.

*3: Where mains tap water is not readily available for cooling burnt area.

11. Guidelines on First-Aid at Places of Work, Health and Safety Authority

Appendix 2: Directors of Public Health

Dr Elizabeth Keane Director of Public Health HSE South Floor 2, Block 8, St Finbarr's Hospital, Douglas Road, Cork. **Tel. No. (021) 4927601** Fax. No. (021) 4923257	Dr Margaret Fitzgerald Acting Director of Public Health HSE Dublin-Mid Leinster Dr Steeven's Hospital Dublin 8. **Tel. No. (01) 6352145** Fax. No. (01) 6352103
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Appendix 3 Notifiable Diseases in Ireland[12]

Disease	Causative Pathogen
Acute anterior poliomyelitis	Polio virus
Ano-genital warts	Human papilloma virus
Anthrax	*Bacillus anthracis*
***Bacillus cereus* food-borne infection/intoxication**	*Bacillus cereus*
Bacterial meningitis (not otherwise specified)	
Botulism	*Clostridium botulinum*
Brucellosis	*Brucella* spp.
***Campylobacter* infection**	*Campylobacter* spp.
Carbapenem-resistant *Enterobacteriaceae* infection (invasive)	Carbapenem-resistant *Enterobacteriaceae* (blood, CSF or other normally sterile site)
Chancroid	*Haemophilus ducreyi*
Chickenpox – hospitalised cases	Varicella-zoster virus
Chikungunya disease	Chikungunya virus
***Chlamydia trachomatis* infection (genital)**	*Chlamydia trachomatis*
Cholera	*Vibrio cholerae*
***Clostridium difficile* infection**	*Clostridium difficile*
***Clostridium perfringens* (type A) food-borne disease**	*Clostridium perfringens*
Creutzfeldt Jakob disease	
variant Creutzfeldt Jakob disease	
Cryptosporidiosis	*Cryptosporidium parvum, hominis*
Cytomegalovirus infection (congenital)	Cytomegalovirus
Dengue fever	Dengue virus
Diphtheria	*Corynebacterium diphtheriae* or *ulcerans* (toxin producing)
Echinococcosis	*Echinococcus* spp.
Enterococcal bacteraemia	*Enterococcus* spp. (blood)
***Escherichia coli* infection (invasive)**	*Escherichia coli* (blood, CSF)
Giardiasis	*Giardia lamblia*
Gonorrhoea	*Neisseria gonorrhoeae*
Granuloma inguinale	*Klebsiella granulomatis*
***Haemophilus influenzae* disease (invasive)**	*Haemophilus influenzae* (blood, CSF or other normally sterile site)
Hepatitis A (acute) infection	Hepatitis A virus
Hepatitis B (acute and chronic) infection	Hepatitis B virus
Hepatitis C infection	Hepatitis C virus
Herpes simplex (genital)	Herpes simplex virus
Human immunodeficiency virus infection	Human immunodeficiency virus
Influenza	Influenza A and B virus
***Klebsiella pneumoniae* infection (invasive)**	*Klebsiella pneumoniae* (blood or CSF)
Legionellosis	*Legionella* spp.
Leprosy	*Mycobacterium leprae*
Leptospirosis	*Leptospira* spp.
Listeriosis	*Listeria monocytogenes*
Lyme disease (neuroborreliosis)	*Borrelia burgdorferi*
Lymphogranuloma venereum	*Chlamydia trachomatis*
Malaria	*Plasmodium falciparum, vivax, knowlesi, ovale, malariae*
Measles	Measles virus
Meningococcal disease	*Neisseria meningitidis*
Mumps	Mumps virus
Non-specific urethritis	
Noroviral infection	Norovirus
Paratyphoid	*Salmonella* Paratyphi
Pertussis	*Bordetella pertussis*
Plague	*Yersinia pestis*
***Pseudomonas aeruginosa* infection (invasive)**	*Pseudomonas aeruginosa* (blood or CSF)
Q Fever	*Coxiella burnetii*
Rabies	Rabies virus
Respiratory syncytial virus infection	Respiratory syncytial virus
Rotavirus infection	Rotavirus
Rubella	Rubella virus

12. Infectious Diseases (Amendment) Regulations 2011 (SI No. 452 of 2011)

Salmonellosis	*Salmonella* spp. other than *S.* Typhi and *S.* Paratyphi
Severe Acute Respiratory Syndrome (SARS)	SARS-associated coronavirus
Shigellosis	*Shigella* spp.
Smallpox	Variola virus
Staphylococcal food poisoning	Enterotoxigenic *Staphylococcus aureus*
***Staphylococcus aureus* bacteraemia**	*Staphylococcus aureus* (blood)
***Streptococcus* group A infection (invasive)**	*Streptococcus pyogenes* (blood, CSF or other normally sterile site)
***Streptococcus* group B infection (invasive)**	*Streptococcus agalactiae* (blood, CSF or other normally sterile site)
***Streptococcus pneumoniae* infection (invasive)**	*Streptococcus pneumoniae* (blood, CSF or other normally sterile site)
Syphilis	*Treponema pallidum*
Tetanus	*Clostridium tetani*
Toxoplasmosis	*Toxoplasma gondii*
Trichinosis	*Trichinella* spp.
Trichomoniasis	*Trichomonas vaginalis*
Tuberculosis	*Mycobacterium tuberculosis* complex
Tularemia	*Francisella tularensis*
Typhoid	*Salmonella* Typhi
Typhus	*Rickettsia prowazekii*
Verotoxigenic *Escherichia coli* infection	Verotoxin producing *Escherichia coli*
Viral encephalitis	
Viral haemorrhagic fevers	
Viral meningitis	
West Nile fever	West Nile virus
Yellow fever	Yellow fever virus
Yersiniosis	*Yersinia enterocolitica, Yersinia pseudotuberculosis*

Appendix 4: Classification of biological agents

Extract from S.I. No. 146/1994 Safety, Health and Welfare at Work (Biological Agents) Regulations, 1994.

BACTERIA and similar organisms	
Biological Agent	**Classification (Group)**
Actinobacillus actinomycetemcomitans	2
Actinomadura madurae	2
Actinomadura pelletieri	2
Actinomyces gerencseriae	2
Actinomyces israelii	2
Actinomyces pyogenes	2
Actinomyces spp.	2
Arcanobacterium haemolyticum (corynebacterium haemolyticum)	2
Bacillus anthracis	3
Bacteroides fragilis	2
Bartonella baciliformis	2
Bordetella brochiseptica	2
Bordetella parapertussis	2
Bordetella pertussis	2
Borrelia burgdorferi	2
Borrelia duttonii	2
Borrelia recurrentis	2
Borrelia spp.	2
Brucella abortus	3
Brucella canis	3
Brucella melitensis	3
Brucella suis	3
Campylobacter fetus	2
Campylobacter jejuni	2
Campylobacter spp.	2
Cardiobacterium hominis	2
Chlamydia pneumoniae	2
Chlamydia trachomatis	2
Chlamydia psittaci (avian strains)	3
Chylamydia psittaci (other strains)	2
Clostridium botulinum	2
Clostridium perfringens	2
Clostridium tetani	2
Clostridium spp.	2
Corynebacterium diphtheriae	2
Corynebacterium minutissiumum	2
Corynebacterium pseudotuberculosis	2
Corynebacterium spp.	2

Coxiella burnetii	3
Edwardsiella tarda	2
Ehrlichia sennetsu (Rickettsia sennetsu)	2
Ehrlichia spp.	2
Eikenella corrodens	2
Enterobacter aerogenes/cloacae	2
Enterobacter spp.	2
Enterococcus spp.	2
Erysipelothrix rhusiopaethiae	2
Escherichia coli (with the exception of non-pathogenic strains)	2
Flavobacterium meningosepticum	2
Fluoribacter bozemanae (Legionella)	2
Francisella tularensis (Type A)	3
Francisella tularensis (Type B)	2
Fusobacterium necrophorum	2
Gardnerella vaginalis	2
Haeomophilus ducreyi	2
Haemophilus influenzae	2
Haemophilus spp.	2
Helicobacter pylori	2
Klebsiella oxytoca	2
Klebsiella pneumoniae	2
Klebsiella spp.	2
Legionella pneumophila	2
Legionella spp.	2
Leptospira interrogans (all serovars)	2
Listeria monocytogenes	2
Listeria ivanovii	2
Morganeila morganii	2
Mycobacterium africanum	3
Mycobacterium avium/intracellulare	2
Mycobacterium bovis (except BCG strain)	3
Mycobacterium chelonae	2
Mycobacterium fortuitum	2
Mycobacterium kansasii	2
Mycobacterium leprae	3
Mycobacterium maimoense	2
Mycobacterium marinum	2
Mycobacterium microti	3(*)
Mycobacterium paratuberculosis	2
Mycobacterium scrofulaceum	2
Mycobacterium simiae	2
Mycobacterium szulgai	2
Mycobacterium tuberculosis	3

Mycobacterium ulcerans	3(*)
Mycobacterium xenopi	2
Mycobacterium pneumoniae	2
Neisseria gonorrhoeae	2
Neisseria meningitidis	2
Nocardia asteroides	2
Nocardia brasiliensis	2
Nocardia farcinica	2
Nocardia nova	2
Nocardia otitdiscaviarum	2
Pasteurella multocida	2
Pasteurella spp.	2
Peptostreptococcus anaerobus	2
Plesiomonas shigelloides	2
Porphyromonas spp.	2
Prevotella spp.	2
Proteus mirabilis	2
Proteus penneri	2
Proteus vulgaris	2
Providencia alcaifaciens	2
Providencia rettgeri	2
Providencia spp.	2
Pseudomonas aeruginosa	2
Pseudomonas mallei	3
Pseudomonas pseudomallei	3
Rhodococcus equi	2
Rickettsia akari	3(*)
Rickettsia canada	3(*)
Rickettsia conorii	3
Rickettsia montana	3(*)
Rickettsia typhi	3
Rickettsia prowazeki	3
Rickettsia Rickettsii	3
Rickettsia tsutsugamushi	3
Rickettsia spp.	2
Rochalimaea quintana	2
Salmonella Arizonae	2
Salmonella Enteritidis	2
Salmonella Typhimurium	2
Salmonella Paratyphi A, B, C	2
Salmonella Typhi	3(*)
Salmonella	2
Serpulina spp.	2
Shigella boydii	2
Shigella dysenteriae	3(*)

Shigella flexneri	2
Shigella sonnei	2
Staphylococcus aureus	2
Streptobacillus moniliformis	2
Streptococcus pneumoniae	2
Streptococcus pyogenes	2
Streptococcus spp.	2
Treponema carateum	2
Treponema pallidum	2
Treponema pertenue	2
Treponema spp.	2
Vibrio cholerae	2
Vibrio parahaemolyticus	2
Vibrio spp.	2
Yersinia enterocolitica	2
Yersinia pestis	3
Yersinia pseudotuberculosis	2
Yersina spp.	2

VIRUS	
Adenoviridae	2
Arenaviridae Junin virus	4
Lymphocytic choriomeningitis virus	3
Lymphocytic choriomeningitis virus	2
Machupo virus	4
Mopeia virus and other Tacaribe viruses	2
Astroviridae	2
Astroviridae	2
Bunyaviridae: Bunyamwera virus	2
Bunyamwera virus	2
Oropouche virus	3
California encephalitis virus	2
Hantaviruses:	2
Hantaan	3
Seoul virus	3
Puumala virus	2
Prospect Hill virus	2
Other hantaviruses	2
Nairoviruses:	
Crimean-Congo haemorrhagic fever	4
Hazara virus	2
Phleboviruses:	
Rift Valley fever	3
Sandfly fever	2

Toscana virus	2
Other bunyaviridae known to be pathogenic	2
Calciviridae:	
Norwalk virus	2
Other Caliciviridae	2
Coronaviridae	2
Filoviridae:	
Ebola virus	4
Marburg virus	4
Flaviviridae:	
Australia enciphalitis (Murray Valley encephalitis)	3
Central European tick-borne encephalitis virus	3(*)
Absettarov	3
Hanzalova	3
Hypr	3
Kuminge	3
Dengue virus type 1 - 4	3
Hepatitis C virus	3(*)
Japanese B encephalitis	3
Kyasanur Forest	3
Louping ill	3
Omsk	3
Powassan	3
Roccio	3
Russian spring-summer encephalitis (TBE)	3
St Louis encephalitis	3
Wesselbron virus	3(*)
West Nile fever virus	3
Yellow fever	3
Other flaviviruses known to be pathogenic	2
Hepadnaviridae:	
Hepatitis B virus	3(*)
Hepatitis D virus (Delta) (b)	3
Herpesviridae	
Cytomegalovirus	2
Epsteir-Barr virus	2
Herpesvirus simiae (B virus)	3
Herpes simplex viruses types 1 and 2	2
Herpesvirus varicella-zoster	2
Human B-lymphotropic virus (HBLV-HHV6)	2
Orthomyxoviridae	
Influenza viruses types A, B and C	2
Tick-borne orthomyxovirdae:	
Dhori and Thogoto viruses	2

Papovaviridae	
BK and JC viruses	2
Human papillomaviruses	2
Paramyxovirdae	
Measles virus	2
Mumps virus	2
Newcastle disease virus	2
Parainfluenza viruses types 1 to 4	2
Respiratory scncytial virus	2
Parvoviridae	
Human parvovirus (B19)	2
Picornaviridae	2
Acute haemorrhagic conjunctivitis virus (AHC)	2
Coxsacki viruses	2
Echo viruses	2
Hepatitis A virus (human enterovirus type 72)	2
Polioviruses	2
Rhinoviruses	2
Poxvirdae	
Buffalopox virus	2
Cowpox virus	2
Elephantopox virus	2
Milkers' node virus	2
Molluscum contagiosum virus	2
Monkeypox virus	3
Orf virus	2
Rabbitpox virus	2
Vaccinia virus	2
Variola (major and minor) virus	4
White pox virus ("Variola virus")	4
Yatapox virus (Tana and Yaba)	2
Reoviridae	
Coltiviruses	2
Human rotaviruses	2
Orbiviruses	2
Reoviruses	2
Retroviridae	
Human immunodeficiency viruses	3
Human T-cell lymphotropic viruses (HLTV)	3
Rhabdoviridae:	
Rabies virus	3(*)
Vesicular stomatitis virus	2
Togaviridae	

Alfaviruses:	
Eastern equine encephalomyelitis	3
Bebaru virus	2
Chikungunya virus	3(*)
Everglades virus	3(*)
Mayaro virus	3
Mucambo virus	3
Ndumu virus	3
O'nyong-nyong virus	2
Ross River virus	2
Semlike Forest virus	2
Sindbis virus	2
Tonate virus	3(*)
Venezuelan equine encephalomyelitis	3
Western equine encephalomyelitis	3
Other known alfaviruses:	2
Rubivirus	2
Toroviridae	2
Unclassified viruses	
Blood-borne hepatitis viruses not yet identified	3(*)
Hepatitis E virus	3(*)
Unconventional agents associated with:	
Creuzfeld-Jakob disease	3
Gerstmann-Sträussler-Scheinker syndrome	3
Kuru	3

PARASITES	
Acanthamoeba castellani	2
Ancylostoma duodenale	2
Angiostrongylus cantonensis	2
Angiostrongylus Costaricensis	2
Ascaris lumbriocoides	2
Ascaris suum	2
Babesia divergens	2
Babesia microti	2
Balantidium coli	2
Brugia malayi	2
Brugia pahangi	2
Capillaria philippinensis	2
Capillaria spp.	2
Clonorchis sinensis	2
Clonorchis viverrini	2
Cryptosporidium parvum	2

Cryptosporidium spp.	2
Dipetalonema streptocerca	2
Diphyllobothrium latum	2
Dracunculus medinensis	2
Echinococcus granulosus	3
Echinococcus multilocularis	3
Echinococcus vogeli	3
Entamoeba histolytica	2
Fasciola gigantica	2
Fasciola hepatica	2
Fasciolopsis buski	2
Giardia lamblia (Giardia intestinalis)	2
Hymenolepis diminuta	2
Hymenolepisnana	2
Leishmania brasiliensis	3
Leishmania donovani	3
Leishmania ethiopica	2
Leishmania mexicana	2
Leishmania peruviana	2
Leishmania tropica	2
Leishmania major	2
Leishmania spp.	2
Loa Loa	2
Mansonello ozzardi	2
Mansonella perstans	2
Naegleria flowleri	3
Necator americanus	2
Onchocerca volvulus	2
Opisthorchis felineus	2
Opisthorchis spp.	2
Paragonimus westermani	2
Plasmodium falciparum	3
Plasmodiums spp (human and simian)	2
Sarcocystis suihominis	2
Schistosoma haematobium	2
Schistosoma intercalatum	2
Schistosoma japonicum	2
Schistosoma mansoni	2
Strongyloides stercoralis	2
Strongyloides spp.	2
Taenia saginata	2
Taenia solium	3
Toxocara canis	2
Toxoplasma gondii	2

Trichinella spiralis	2
Trichuris trichiuria	2
Trypanosoma brucei brucei	2
Trypanosoma brucei gambiense	2
Trypanosoma brucei rhodesiense	3
Trypanosoma cruzi	3
Wuchereria bancrofti	2

Appendix 5: Hazard Group 4 Infectious Diseases

(As described under Safety, Health and Welfare at Work (Biological Agents) Regulations, 1994.)

In cases of death from these diseases, the body should not be embalmed, and should be kept enclosed in a body bag.

- **Smallpox**
- **Viral haemorrhagic fevers (VHF), including:**
  - **Lassa**
  - **Ebola**
  - **Marburg**
  - **Crimean-Congo viruses**

Managing a fatal case of Hazard Group 4 Infectious Diseases including Viral Haemorrhagic Fevers

In addition to following the advice regarding the use of Standard Precautions as outlined in the document, the following is required for Hazard Group 4 infectious diseases:

- As with all other infectious disease threats, confidentiality must be maintained after death.
- The risk of infection must be communicated clearly, either verbally or in writing as appropriate, by the attending hospital clinician to those who will be handling the body. These include ward staff, porters, mortuary staff, bereaved relatives, funeral directors and pathologists.
- For VHF, this risk is categorised as High.
- As there is an increased risk of leakage of body fluids in those who are deceased, Standard Precautions including appropriate additional PPE where necessary, eg gloves and gown, (and goggles if deemed necessary) should be used when handling human remains.
- The deceased must be placed in a body bag ***immediately after death.***
- It is imperative that a funeral director is informed that the body poses a significant health risk.
- No hygienic preparation of the body should be undertaken. This applies even if a cultural or religious requirement exists. This requires careful and sensitive discussion with relatives.
- Plugging of orifices is not permitted.
- Drains, catheters, intravenous lines etc should not be removed.
- Implanted medical devices, eg pacemakers or defibrillators should not be removed. As a result, bodies containing an implanted medical device cannot be cremated as they pose an explosion risk.
- Funeral directors must use Standard Precautions at all times.
- The body should be placed in a lead lined coffin, which should then be sealed prior to removal from the unit.
- Embalming should not be carried out.
- Waking of the body at home should not take place
- Viewing of the body should be forbidden in order to protect the health of relatives and staff.
- Post-mortem examination should not be undertaken (in accordance with Royal College of Pathologists' guidelines)
- In the situation where a death has occurred but the diagnosis hasn't been confirmed antemortem, yet VHF is considered highly likely, then blood should first be taken and tested for VHF. If the test is negative then post-mortem can be carried out safely. If positive, a post-mortem should not be carried out. Note that VHF can only be reliably detected for up to two days post mortem

Extracts from Guidelines on Autopsy Practice: a Report of a working group of The Royal College of Pathologists, September 2002 (UK)

6.10 Pre-autopsy assessment of Hazard Group 4 (VHF) risk in a cadaver

The ACDP's publication on management of VHF and the HSAC's *Safe working* document specifically state that autopsies on such cases are not to be done in the UK because of the risk of infection, the relatively high mortality and the lack of totally effective chemotherapy. If an autopsy is deemed necessary for clinical or medico-legal reasons, it should be referred to a specialist centre, where appropriate protocols have been developed. But there needs to be a procedure for dealing with suspected cases of fatal VHF, which happen several times a year in the UK, and where the diagnosis has not been established nor excluded prior to death. In these cases, the Coroner will be informed since the cause of death is unknown. It is important to confirm or exclude VHF quickly. Recommendations are given in Appendix 2, Guidelines for assessing presence of Hazard Group 4 Pathogens in a cadaver.

A2 Guidelines for assessing presence of Hazard Group 4 Pathogens in a cadaver.

A2.1 Blood from the patient, taken before or after death, is to be tested for the main viral haemorrhagic fevers (VHFs), dengue, yellow fever, falciparum malaria, Nipah virus and leptospirosis. The Public Health Laboratory Service (Colindale) and Centre for Applied Microbiological Research (Porton Down) laboratories can do this in a working day if the samples are couriered. The geographical history of the patient is important in determining whether the patient could realistically have acquired a VHF or the other infections that clinically mimic VHF (malaria, leptospirosis, dengue, Nipah).

A2.2 If these tests show absence of the viral infections but presence of falciparum malaria or leptospirosis, then the autopsy is safe to perform under standard conditions.

A2.3 If Nipah virus infection is demonstrated, referral to a specialist centre can be considered or the autopsy not done.

A2.4 If dengue or yellow fever virus infection is demonstrated, the autopsy can be done under enhanced HG#3 conditions (ie as for HIV infection).

A2.5 If a VHF is confirmed, then the autopsy is not done.

Appendix 6: Standard Precautions

For all those involved in the care of others, whether living or deceased, in a professional setting, there are basic precautions which should be adhered to in all circumstances.

1. Hand Washing[13]

Hand washing is the single most effective action to reduce the risk of infection. The use of gloves does not mean that there is no need for thorough hand washing after removal.

2. Skin

- Cover all cuts or abrasions in any area of exposed skin with a waterproof dressing
- Alcohol rubs/gel should be available
- Keep nails short. Nail varnish and false nails should not be worn as they harbour micro-organisms.
- Jewellery below the elbow is not permitted, with the exception of a plain band denoting marital status.

3. Gloves

Non-sterile gloves should be worn for all invasive and non-invasive procedures. Gloves should be of a non-powdered variety to reduce the risk of allergic reactions. The gloves must be discarded at the end of each procedure. Natural rubber latex gloves are the most appropriate, but non-natural rubber latex is also suitable. Vinyl gloves may be porous and should not be used. Consideration should be given to the use of reinforced or cut-resistant gloves for post-mortems.

4. Mouth and Eye protection

Appropriate face and eye protection should be worn where there is a risk of blood, body fluids or excretions splashing into the face or mouth.

If splashed with blood/body fluids, irrigate with copious amounts of water/saline, and if the source was a known case of an infectious disease, seek immediate appropriate medical advice, such as Occupational Health, Infectious Disease or Microbiology Department immediately.

5. Sharps

An approved sharps container conforming to UN 3291 or BS 7320 standards should be placed next to the body before any sharps are used. Extreme care must be exercised during the use and disposal of sharps. The use of disposable blades and needles is recommended and should be disposed of by the person who uses them. Needles should not be resheathed prior to disposal into approved sharps containers. These should never be over filled, and should be closed when at two-thirds capacity.

13. Guidelines for Hand Hygiene in Irish Health Care Settings, SARI Infection Control Subcommittee.

Appendix 7: Standard Precautions for mortuary staff and funeral directors and staff handling human remains

1. Hygienic practices
No eating, smoking or drinking should be permitted or any other action that will bring the hands into contact with the face within the work areas that involve handling of remains, embalming, etc.

2. Protective clothing
Protective clothing must be provided for use in the workroom and be used at all times. This includes:

- waterproof aprons
- gowns
- gloves
- overshoes or Wellington boots
- appropriate eye protection.

Face and eye protection includes:

- face shield or surgical mask
- goggles or mask with eye shield.

Facilities must be provided for storage, cleaning and safe disposal of protective clothing after use.

Work clothes must not be worn outside the premises.

Shower facilities should be available.

3. Standard Operating Procedures
Employers should have written safety policies and Standard Operating Procedures (SOPs) which should be read by all staff who enter the workrooms. Employers should provide training in Standard Precautions. Employees are expected to follow infection prevention and control guidelines and policies issued by their employers and to maintain high standards of personal hygiene.

4. First Aid Box
A First Aid Box must be provided, and an eye wash station. For contents of a first aid box see Appendix 1. According to the minimum standards set by the British Institute of Embalmers, and the Irish Association of Funeral Directors, there should be an eye wash station in every embalming facility.

5. Accidents
All accidents in the workroom must be reported at once to the supervisor and recorded in the Risk Incident form. This is particularly important with sharps injuries.

6. Immunisations
Staff members should be fully immunised against poliomyelitis, tuberculosis, tetanus and hepatitis B and should keep a record of details of this information. This is dealt with in more detail in Chapter 20.

7. Spillages
Spillages of blood or other body fluids that may be contaminated with blood should be dealt with as described in Chapter 5.1.

8. Hazards involved in the handling of personal effects
Great care must be taken by any staff involved in checking bodies for personal effects. Tongs should be used to remove items from pockets, as in some situations pockets may contain items such as syringes. Any such items found on the person should be made safe by placing in an appropriate sealed container and sent with the body for post-mortem examination and analysis if appropriate.

Appendix 8: Handling sharps

As a minimum requirement the use of disposable sharps should be standard practice. They should be used in conjunction with a wall mounted blade remover.

Particular care should be taken when handling sharp instruments, eg scalpel blades, and appropriate protective clothing should be worn throughout. The following should be observed as a matter of course:

- Sharps containers should be assembled correctly and lids firmly attached before use.
- Sharps must not be passed directly from hand-to-hand, and handling should be kept to a minimum.
- Needles must not be bent or broken prior to use or disposal.
- Needles and syringes must not be disassembled by hand prior to disposal.
- Needles should not be recapped.
- Used sharps must be discarded into a sharps container (conforming to UN3291 or BS 7320 standards) at the point of use by the user. These must not be filled above the mark that indicates that they are full.
- Sharps containers should never be over filled, should be closed securely when at two-thirds capacity, and should be marked/labeled to identify its source before disposal by incineration.
- Containers must be disposed of by the licensed route in accordance with National Waste Management policy.
- Sharps containers should be available at each location where sharps are used.
- Close the aperture to the sharps container when carrying or if left unsupervised to prevent spillage or tampering.
- Place sharps containers on a level stable surface. Assemble sharps containers by following the manufacturer's instructions.
- Carry sharps containers by the handle - do not hold them close to the body.
- Never leave sharps lying around.
- Do not try to retrieve items from a sharps container.
- Do not try to press sharps down to make more room.
- Lock the container when it is two-thirds full using the closure mechanism.
- Label sharps containers with the source details prior to disposal.
- Place damaged sharps containers inside a larger container - lock and label prior to disposal. Do **not** place inside clinical risk waste bags.

Appendix 9: Protective clothes for embalming

Protective clothing for embalming should include:

- overalls which are either disposable or can be washed at high temperature
- full length fluid-resistant gown
- chemical proof, non-slip Wellington type boots
- plastic apron, covering tops of boots
- protective waterproof sleeves
- appropriate heavy duty disposable gloves
- face/eye protection (goggles/protective spectacles/visor).

Appendix 10: Dealing with spillages[14]

Procedure for blood spillage

1. Identify hazard area and put "Wet Caution" sign in place to warn others of risk.
2. Wearing appropriate personal protective equipment (PPE), cover the spillage with paper towels.
3. Cover paper towels with undiluted hypochlorite / NaDCC Sodium Dichloroisocyanurate, ie proprietary household bleach at concentrations recommended by the manufacturer and leave for 2 minutes.
4. Wipe up spillage with paper towels. Discard in yellow waste bag.
5. Wash area with detergent and hot water using disposable cloths.
6. Dispose of apron and gloves in yellow waste bag. Wash hands.

Procedure for urine spillage

1. Wear appropriate PPE.
2. Identify hazard area and put "Wet Caution" sign in place to warn others of risk.
3. Wipe up spillage with paper towels. Discard into domestic waste bag unless contaminated with blood or infection suspected/known.
4. Wash area with detergent and hot water using disposable cloths.
5. Dispose of apron and gloves in black bag. Wash hands.
6. Do not use hypochlorite / NaDCC disinfectant on urine as it reacts with the acid in urine to release a toxic vapour.

Procedure for spillage of other body fluids, eg sputum, vomit, faeces

1. Wear appropriate PPE.
2. Identify hazard area and put "Wet Caution" sign in place to warn others of risk.
3. Wipe up spillage with paper towels. Discard in domestic waste bag unless blood contaminated or infection known/suspected.
4. Wash area with detergent and hot water using disposable cloths.
5. Dispose of apron and gloves in black waste bag. Remove PPE and decontaminate hands.

14. Infection Prevention & Control Guidelines, HSE North-East, 2006

Appendix 11: Guidance Note for Funeral Directors/ Embalmers Handling Potentially Infectious Human Remains

This note should be read in conjunction with the HPSC Document "Guidelines for the Management of Deceased Persons Harbouring Infectious Disease".

Although only a tiny minority of people in Ireland die from an infectious disease, it is never possible to be sure that human remains do not pose an infectious risk. As Funeral Directors and Embalmers have very close contact with cadavers and their body fluids, they are at increased risk of acquiring infection unless preventive steps are taken to reduce that risk. Funeral Directors whose work can involve washing and handling of the remains and embalmers, whose work will involve arterial and cavity embalming, and packing are at increased risk of being exposed to infection, particularly through sharps injury. The most effective way to minimise that risk is through the effective and continual application of Standard Precautions (Appendix 6: *Management of Deceased Persons Harbouring Infectious Disease*)[1].

Embalming is a procedure undertaken to help preserve the human body after death, and to prevent the spread of infection both before and after burial. In order to preserve from putrefactive (and to destroy pathogenic or disease-causing) organisms, embalming fluids are used to provide effective disinfection. The embalming process involves the substitution of blood with a preservative solution and treatment of the body cavity and organs with a similar preservative.

Embalming aims to prevent the spread of infectious agents both before and after burial. The nature of an embalmer's work is such that they may come into contact with potentially infectious human remains - embalming being an exposure-prone activity - with transmission of infectious agents being possible through a number of routes of exposure, including an increased likelihood of sharps injury - for example from shards or spicules of shattered bone, or from surgical implements (knives, needles) - and from increased exposure to blood and other, potentially infectious, body fluids.[2] In addition, if there is a delay in the time taken to undertake post-mortem procedures, then the likelihood of the replication of certain pathogens with the consequent increase in bacterial load can become a potential problem.[3] Embalming, thus, places a potential infectious risk upon the embalmer. Evidence from the UK indicates that the longer the dead body remains untreated, the higher is its bacteria load. In addition, following death there is an increase, not only in the number of microbial cells, but also of their virulence.[4] In addition, indicator organisms (originating in the large intestine) can translocate or move around the body within a post mortem interval of four to eight hours.

As a result of these risks, **all human remains should be treated as if infectious**, and Funeral Directors and Embalmers should, therefore, use **Standard Precautions** during every moment of contact with a cadaver, with body parts, soiled instruments or soiled garments. The most effective way to minimise the risk of disease transmission is through strict adherence to **Standard Precautions** including the application of steps to minimise the potential for sharps injuries and other exposures. The use of Standard Precautions should be an essential requirement for all staff handling all human remains. Most infections remain undiagnosed; hence it is crucial that Standard Precautions are applied uniformly and in every case.

1. Full information on the use of Standard Precautions in a funeral or post-mortem setting is laid out in Appendix 6: Standard Precautions of HPSC' Management of Deceased Persons Harbouring Infectious Disease available at www.hpsc.ie/
2. *Body fluids* include: Tissue fluid (e.g. fluid released when skin-slip occurs), Semen, Vaginal secretions, Cerebrospinal fluid, Amniotic fluid, Pericardial and pleural fluids, Faeces, Urine, Vomit (purge), Sweat and Blood.
3. Health and Safety Executive. *Controlling the risks of infection at work from human remains*. Crown Copyright. HSE, London: 2005.
4. Creely KS. *Infection risks and Embalming.* Research Report TM/04/01 March 2004. Institute of Occupational Medicine. Edinburgh: 2004. Available at http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1200660063059

The following are guiding principles to minimise infectious risk for embalming staff:

1. All staff should ensure that they are fully familiar with, and **use Standard Precautions during every moment of contact with a cadaver**
2. Human remains known or suspected of harbouring pathogens in **Hazard Group 4 or transmissible spongiform encephalopathies (TSEs)[5] should not undergo embalming**
3. **The Notification of Death Form should be completed by the deceased's Medical Practitioner in every case.** The Funeral Director should ensure that the attending physician completes this form before taking receipt of the deceased. This form will contain the contact details of the doctor who will be familiar with the medical history of the deceased, should s/he require to be contacted in the event of the Funeral Director or one of his staff sustaining a sharps injury.
4. Should any embalming staff **suffer a sharps or splash injury**, they should:
   a. **Seek immediate medical advice** from their local Occupational Health Department, Emergency Department or General Practitioner,
   b. **Bring with them** the clinical information (if the deceased person suffered with a disease caused by a Hazard Group 4 pathogen or TSE) and attending physician's contact details contained in the **Notification of Death form**.
   c. Their **medical advisor will then advise treatment/interventions** along the lines laid out in the HPSC's guidance document **Emergency Management of Injuries** available at www.emitoolkit.ie.

Standard Precautions

The Standard Precautions (Appendix 7) include the following core elements:

- **Handwashing**: after all procedures, after delivery or collection of the cadaver, after removing gloves, before handling any food
- **No smoking or eating** – or other activities that can bring the hands in contact with the face within the work areas that involve handling of remains
- Use of appropriate **Protective Clothing**
  - waterproof aprons
  - gowns
  - gloves
  - overshoes or Wellington boots
  - appropriate eye protection (face shield or surgical mask; goggles or mask with eye shield)
- Use of **Specific Embalming protective clothing** (Appendix 9) during embalming procedures (including embalming suit/overalls, full length gown, Wellington boots, plastic apron, heavy duty gloves and eye protection)

Other Important Issues relating to Standard Precautions (for full explanation see Appendix 7):

- **Proper skin care** (i.e. covering cuts, avoid use of false nails etc)
- **Spillages**: must be dealt with immediately (see Chapter 5.1)
- **Use of Standard Operating Procedures**
- **First Aid Box**: A First Aid Box must be provided, and an eye-wash station.
- Dealing with **hazards relating to handling of the deceased's personal effects**
- **Accidents**: All accidents in the workroom must be reported at once to the supervisor and recorded in the Risk Incident form.
- **Immunisation** (see Chapter 20): Staff members should be fully immunised against poliomyelitis, tuberculosis, tetanus and Hepatitis B.

5. Biological agents are classified into four Hazard Groups, from 1 to 4, where 1 represents the lowest level of risk and 4 represents the highest level. TSEs are Transmissible Spongiform Encephalopathies (such as variant Creutzfeldt-Jakob Disease. If human remains are known to be infected with Hazard Group 4 pathogens or a TSE, it is imperative that a funeral director be informed that this body poses a significant health risk and embalming should not be carried out.

It should be noted that the likelihood of transmission of infectious disease during embalming is low, but the potential for injury will be highest when handling sharps.[6] Should an embalmer or funeral director receive a sharps or splash injury during the course of preparing a cadaver, it is crucial that urgent medical advice be sought, and the details of the patients last attending physician provided to permit a thorough risk assessment..

Handling Sharps (Appendix 8)

The use of disposable sharps should be standard practice. They should always be used in conjunction with a wall mounted blade remover. The following practices (see Appendix 8) lessen the likelihood of sharps injury (protective clothing should be worn throughout):

- Correctly assembling sharps boxes
- Sharps must not be passed directly from hand-to-hand,
- Needles should not be bent/broken
- Needles and syringes should not be disassembled
- Needles should not be recapped
- Used sharps must be discarded into a sharps container
- Sharps containers should never be over filled
- Containers must be disposed of by the licensed route
- Sharps containers should be available at every location where sharps are used
- The aperture to the sharps container should be closed when not in use
- Sharps containers should be placed on a level stable surface
- Never leave sharps lying around
- Never retrieve a sharps from a sharps box
- Do not overfill sharps boxes
- Close and lock sharps box when 2/3 full
- Label sharps containers with the source details prior to disposal
- Place damaged sharps containers inside a larger container

Sharps Injury[7]

In the event of a sharps injury, the funeral director or embalmer should take the following steps:

1. Gently encourage bleeding from the wound;
2. Wash the wound in soap and warm running water, but do not scrub the area;
3. Cover the wound with a dressing;
4. In the event of splashing of blood or body fluid to skin, eyes or mouth: wash with plenty of water;
5. Ensure the sharp is disposed of safely;
6. Report the incident to supervisor immediately;
7. Attempt to identify source of the needle/sharp;
8. Obtain the contact details of the Consultant/GP who was in medical attendance of the patient (from the Notification of Death form) and contact that person to alert them of the injury
9. Go immediately to the Emergency Department/Occupational Health Department and have them contact the Consultant/GP who was in medical attendance of the patient to determine if the patient had a known, relevant infectious condition – the ED or Occupational Health Department will organise further follow up
10. Ensure that an accident report form is completed, and record all information in the Incident Report.

6. Full information on handling sharps is available in Appendix 8: Handling Sharps of HPSC's *Management of Deceased Persons Harbouring Infectious Disease* available at www.hpsc.ie/
7 . See Chapter 6. Management of sharps injuries/splashing injuries in HPSC's *Management of Deceased Persons Harbouring Infectious Disease* available at www.hpsc.ie/

Appendix 12: HSE Notification of Death Form

This form should be used when human remains are being transferred from medical care to the care of a Funeral Director/Embalmer. Its function is to provide contact information should a Funeral Director or Embalmer suffer a sharps injury or in some other way be exposed to the deceased body fluids, placing them at risk of infection.

Name of Deceased			
Address		**Date of Birth**	
Date of Death		**Time of Death**	
Source Hospital		**Main Switchboard Phone No**	
Hospital Ward		**Ward Phone No**	
Embalming can be carried out on this patient's remains		Y ☐	N ☐
This patient's remains pose a Hazard Group 4/TSE Risk		Y ☐	N ☐
(NB: See form appendix for conditions in which embalming is **contraindicated**)			
Attending Medical Practitioner:			
Doctor's Name (1)		**Address**	
Telephone§			
Mobile		**Landline**	
Alternative Doctor's Details			
Doctor's Name (2)		**Address**	
Telephone§			
Mobile		**Landline**	

§ *Telephone contact information on the attending medical practitioner must be completed in every case.*

This form should be completed in the case of every death, irrespective of whether the remains pose an infectious risk or not. The parts of the form marked in grey, MUST be FULLY completed before the deceased remains are passed to the care of a Funeral Director. The details of two medical practitioners who are very familiar with the medical history of the deceased should be provided, to enable rapid contact to be made in the event of a sharps injury. All human remains should be treated as if infectious, and Funeral Directors and embalmers should, therefore, use Standard Precautions during every moment of contact with human remains or with human body fluids.

NB: This form must be given to the attending physician/surgeon or General Practitioner for completion by the Funeral Director. The Medical Practitioner should then return the completed original to the Funeral Director and keep a copy for the patient's clinical notes.

Medical Practitioner's Signature _____ **Date**_____

Appendix 13: Diseases that fall into Hazard Group 4, TSEs and other important Bloodborne Viruses¥

Diseases that are categorised as being in Hazard Group 4 (mainly Viral Haemorrhagic fevers and Smallpox and Smallpox-like viruses) and TSEs (Transmissible Spongiform Encephalopathies such as variant Creutzfeldt–Jakob disease), are extremely virulent and have few, if any, effective countermeasures. Accordingly, as these infections/ transmissible agents pose such a significant health risk, **embalming should not be carried out** on the remains of patients known to be harbouring such agents.

Agent	Hazard Group
VIRUSES	
Junin virus	4
Machupo virus	4
Crimean-Congo haemorrhagic fever	4
Ebola virus	4
Marburg virus	4
Variola (major and minor) virus	4
White pox virus ("Variola virus")	4
TSEs	
Creutzfeldt–Jakob disease	3
Gerstmann-Sträussler-Scheinker syndrome	3
Kuru	

§In addition, in the case of a Funeral Director or Embalmer who suffered a needlestick injury while working on a the remains of a patient known to have been harbouring Hepatitis B, Hepatitis C or HIV, it is crucial that the attending physician would rapidly pass on this information, when requested, to the physician assessing and treating such an injured Funeral Director or Embalmer. These are serious bloodborne infections, for which there is the potential for intervention. Full details on management of such injuries is to be found in the Emergency Management of Injuries Toolkit available at http://www.hpsc.ie/hpsc/A-Z/EMIToolkit/.

¥. It is important to check full detail in S.I. No. 146/1994: Safety, Health and Welfare at Work (Biological Agents) Regulations, 1994 available at http://www.irishstatutebook.ie/1994/en/si/0146.html.

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