The Infectious Hazards of Dead Bodies

The bodies of people who die with a communicable disease are a hazard to people who handle or have contact with them. Occupations that have extensive contact with dead bodies are most at risk. Except for a few communicable diseases, infected bodies can be safely embalmed, and viewed by the bereaved. The infectious hazards of dead bodies can be minimised by the use of appropriate infection control procedures.

Living persons with communicable diseases are thought generally to pose a greater risk of transmitting infection than the dead. Most people have little, if any, contact with a dead body, except perhaps following the death of a family member or friend. However, some occupations have frequent and extensive contact with dead bodies. These occupations include pathologists and mortuary attendants, medical and nursing staff, embalmers and funeral directors, members of emergency services, and forensic scientists. The risks of infection from contact with dead bodies were reviewed by the Public Health Laboratory Service in the United Kingdom. This report is largely based on that review.

Infection risks from dead bodies

Table 1 lists the communicable diseases that occur in New Zealand that could potentially be transmitted from a dead body. The diseases are categorised according to degree of risk, although the risk may depend on the procedures being performed on, or the type of contact with, the body. For each disease, *Table 1* also indicates whether the body needs to be transported in a body bag, and whether the body can be safely embalmed and safely viewed by the bereaved.

Tuberculosis, Hepatitis B and C, HIV/AIDS, Creutzfeldt-Jakob disease, meningococcal disease, and Group A streptococcal disease are considered to pose the greatest risks for those handling or in contact with recently dead bodies.

Tuberculosis-infected cadavers present a real danger to persons performing autopsies, especially when power saws are used. Five healthcare workers in the United States were reported to have been infected with tuberculosis during an autopsy.

Hepatitis B and C viruses, and HIV, as bloodborne viruses, pose a particular risk for those in contact with the blood of the deceased. Healthcare workers performing autopsies, embalmers, emergency service workers, and forensic scientists are the occupations most at risk. Skin penetration in the autopsy room can occur through contact with damaged bones and bone spicules, as well as sharp instruments. Needle stick injuries are common among embalmers.[2]

With the recent high rates of meningococcal disease in New Zealand, and a rate among Mäori much higher that among Europeans, the risk of disease transmission during funeral (tangi) practices needed to be considered. It is very unlikely that meningococci would survive in a body, including the nasopharynx, for long after death, especially if the body is embalmed. Transmission of meningococci through hongi (pressing noses), kissing, or other close contact with the body is extremely unlikely. Therefore, there is no justification to alter customary practices at a tangi when the deceased has died from meningococcal disease.

Control of the infection risks

Healthcare facilities should have documented infection control procedures for their autopsy units, and for other services and staff handling dead bodies. These procedures should include the principles of universal precautions. Autopsy staff and embalmers should wear protective clothing, gloves, masks and eyewear. In addition, a recent report from the United States has recommended that, because of the risk of aerosolisation when power-driven tools are used, autopsy workers should wear respirators and work in rooms that have ultraviolet lights and negative air pressure. Autopsy staff and embalmers should be vaccinated against hepatitis B. While vaccination against tuberculosis is available, this is not recommended because of the low effectiveness of BCG in adults. Even if vaccinated against tuberculosis,

autopsy staff and embalmers should take appropriate precautions if working with any deceased who may have died with tuberculosis (or any other infectious disease).

Table 1: *Guidelines for handling human cadavers with communicable diseases*

Infection and degree of risk	Bagging required [1]	Viewing safe [1]	Embalming safe [1]
Low risk			
Chicken pox/shingles	No	Yes	Yes
Influenza types (seasonal and non-seasonal)	No	Yes	Yes
Legionellosis	No	Yes	Yes
Leprosy	No	Yes	Yes
Measles	No	Yes	Yes
Meningitis (except meningococcal)	No	Yes	Yes
Methicillin-resistant staphylococcus aureus	No	Yes	Yes
Mumps	No	Yes	Yes
Psittacosis	No	Yes	Yes
Rubella	No	Yes	Yes
Tetanus	No	Yes	Yes
Whooping cough	No	Yes	Yes
Medium risk			
Cholera	No	Yes	Yes
Food poisoning	No	Yes	Yes
Diphtheria	Advisable	Yes	Yes[2]
Hepatitis A	No	Yes	Yes
HIV/AIDS	Advisable	Yes	No
Leptospirosis	No	Yes	Yes
Malaria	No	Yes	Yes
Meningococcal disease	Advisable	Yes	Yes[2]
Middle Eastern Respiratory Syndrome (MERS)	Yes	Yes	No
Severe Acute Respiratory Syndrome (SARS)	Yes	Yes	No
Scarlet fever	Advisable	Yes	Yes[2]
Tuberculosis	Advisable	Yes	Yes
Typhoid fever	Advisable	Yes	Yes
Viral haemorrhagic fevers (not transmissible between people)	Advisable	Yes	Yes[2]

Infection and degree of risk	Bagging required [1]	Viewing safe [1]	Embalming safe [1]
High risk			
Creutzfeldt-Jakob disease and other transmissible spongiform encephalopathies	Yes	Yes[3]	No
Hepatitis B, C	Yes	Yes	No
Invasive Group A streptococcal disease	Yes	Yes	No
Viral haemorrhagic fevers (transmissible between people)	Yes	Yes	No

[1] Definitions Bagging: placing body in an impervious plastic body bag
Viewing: bereaved seeing, touching, and spending time with the body; if the deceased has been bagged the bag must be left unopened and intact
Embalming: injecting chemical preservatives into the body to slow the process of decay

[2] Requires particular care during embalming

[3] Unless autopsy has been performed, in which case viewing with no physical contact with the deceased (ie no touching or kissing the body) should not be prohibited