

Guidance on Post-mortem Examination of Possible, Probable and Confirmed Cases of Anthrax

This guidance applies while the control of an outbreak of anthrax infections in heroin drug users is being managed in Scotland¹.

This guidance will be modified, if appropriate, as the nature of the current outbreak indicates that adjustments in approach to control and management are necessary.

1. Introduction

This guidance focuses on preventing and controlling infection risks in post-mortem examination of possible, probable and confirmed cases of anthrax (case definitions, as in <http://www.documents.hps.scot.nhs.uk/anthrax-outbreak/case-definition-anthrax-outbreak-v5.pdf>)

This guidance has therefore been written to provide advice on how to conduct post-mortems safely on cases suspected as being linked to this anthrax outbreak and to minimise the risks of infection. On balance the risks associated with conducting a full post-mortem (PM) on such cases may be no higher than on other category 3 pathogens². The following guidance should assist in ensuring safe practice.

The present outbreak is a highly unusual situation. Cases are presenting sometimes in the final stages of a rapidly developing lethal illness. Cases may therefore die before any diagnosis has been made. In view of the uncertainties surrounding the clinical course of the illness and the pathology associated with this unusual presentation of anthrax, ideally full post-mortems should be carried out on all cases where practically possible. This is essential to ensure that the full clinical and pathology picture of the illness can be identified and shared to assist future case diagnosis and management. Further specialised examination of tissues removed at post-mortem may be necessary at specialist laboratories such as the Rare and Imported Pathogens Laboratory (RIPL), HPA Porton.

¹ CMO Letter. *Outbreak of Anthrax Infections in Heroin Drug Users*. (22nd Jan 2010) Available at <http://www.documents.hps.scot.nhs.uk/anthrax-outbreak/cmo-letter-anthrax-2010-01-22>

² The ACDP's (Advisory Committee on Dangerous Pathogens) 'Approved List of biological agents' categorises *Bacillus anthracis* as a Hazard Group (HG) 3 pathogen.

2. Post-Mortem Examination and Post-mortem Room Management

As with any Hazard Group (HG) 3 pathogen³, the need or rationale for a post-mortem (PM) should be carefully considered before proceeding. In this situation there are overriding public health reasons for requesting full post-mortems on all cases. Providing an appropriate category 3 facility is available and the advice provided here can be followed, there is no bar in principle to carrying out post-mortems in such cases. If there are any issues regarding particular aspects then further advice may be sought from Health Protection Scotland (HPS), the relevant Procurator Fiscal or the RIPL HPA Porton.

PMs conducted in this situation should be considered as a 'high risk case' and managed in accordance with the Health and Safety Advisory Committee Guidance, *Safe Working and the Prevention of Infection in the Mortuary and Post-Mortem Room* (2003)⁴.

The presentation of the case should provide a basis for determining which aspects of the PM are likely to be most useful, however ideally a full PM should be conducted. Evidence of any injection marks will assist determining if heroin was administered by injection. Inspection of the brain will be particularly important especially where there is any suggestion of cerebral symptoms (cases have presented as suspected sub-arachnoid haemorrhage or meningitis). Opening of the head may increase the risk of aerosol production but is covered in the guidance. Presentation may also suggest inhalation anthrax, hence full inspection of lungs and the chest cavity is very important. Ingestion of anthrax via snorting may also feature hence examination of the upper GI tract is important.

The degree of risk at post-mortem will depend on the clinical presentation and whether or not antibiotics were administered prior to death. Administration of appropriate antibiotics before death is very likely to reduce the risk of circulating viable organisms and so reduce any risk associated with a post-mortem.

In the post-mortem room, the main hazards are likely to be inoculation through cuts, splash of body fluids and any aerosol created by procedures such as removal of the skull cap.

- All staff participating in the PM should have experience of high risk cases.

³ The ACDP's (Advisory Committee on Dangerous Pathogens) 'Approved List of biological agents' categorises *Bacillus anthracis* as a Hazard Group (HG) 3 pathogen.

⁴ Health and Safety Executive (HSE) and Health and Safety Commission's Health Services Advisory Committee (HSAC) (2003) *Safe Working and the Prevention Infection in the Mortuary and Post-Mortem Room*, 2nd Ed.

3. Infection Control Precautions

3.1. Facilities

- If possible, PMs should be carried out in a high containment (CL3) post-mortem facility.
- If high containment (CL3) facilities are not available, the body should be placed on a down-draught table which will contain spillages.

3.2. Personal Protective Equipment (PPE)

- The number of staff involved in the PM should be minimised⁵.
- Staff should wear:
 - a disposable Tyvek suit or similar coverall;
 - FFP3 respirator and face visor (the use of air-fed hoods are not strictly advised but would provide an added level of protection that should be considered at individual basis, e.g. if opening of the head is carried out);
 - cut-resistant safety gloves of heavy duty neoprene, latex, nitrile or butyl gloves worn over a pair of normal laboratory gloves (latex or vinyl);
 - boots with dorsal reinforcement.
- At the end of the examination, a team member should ensure that:
 - all disposable clothing and PPE worn during the examination is disposed of via incineration;
 - non-disposable items such as visors and boots should be sterilised by autoclaving or immersion in 10,000 ppm hypochlorite for at least 1 hour.

3.3. Waste generated during PM examination

- Sharps, any linen and all waste generated during the PM must be incinerated or autoclaved.

3.4. Reusable post-mortem instruments

- All reusable surgical instruments must be autoclaved.

⁵ Health and Safety Executive (HSE) and Health and Safety Commission's Health Services Advisory Committee (HSAC) (2003) *Safe Working and the Prevention Infection in the Mortuary and Post-Mortem Room*, 2nd Ed. (Paragraph 78)

3.5. Environmental decontamination

Anthrax forms infectious spores on contact with air or soil or when nutrient limited. Spores are therefore likely to form in neglected blood spillages, and in nature, form in the soil where body fluids have leaked from a dead or dying animal. Therefore:

- Any blood and body fluid spills should be washed thoroughly with abundant water and surfactant to remove organic material and the surfaces cleansed with 10,000 ppm av of hypochloride (*with contact time of 10mins*). This will affect metal surfaces so should be rinsed off thoroughly.
- Waste water should be collected and autoclaved or solidified with gel and destroyed by autoclaving or incineration. If the suite is fitted with an effluent treatment plant then the lab drains can be used so long as the table fluid enters that treatment plant and its cycle is suitable for anthrax spores. The centre of the load must reach a minimum temperature of 121°C for at least 30 minutes.
- PM room HEPA filter should be changed at intervals of not greater than 14 months using a safe change procedure and destroyed by incineration.
- Environmental cleaning should be carried out as per local policy.

3.6. Disposal of remains

The body should not be embalmed, but stored in a leak-proof body bag and cremated. If cremation is not possible, burial in a lead-lined sealed coffin at a depth of 1.8 m or greater would be an alternative.

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