



UK Health
Security
Agency

Rare and Imported Pathogens Laboratory

Anthrax information sheet

Anthrax is primarily a disease of herbivores. Humans acquire it as a result of contact with infected animals or animal products, or from materials infected with *Bacillus anthracis* spores.

In humans, the disease takes one of 3 forms, depending on the route of infection. Cutaneous anthrax, which accounts for more than 95% of cases worldwide, results from infection through skin lesions; intestinal anthrax results from ingestion of spores, usually in infected meat; and pulmonary anthrax results from inhalation of spores.

Cutaneous anthrax

Cutaneous anthrax usually occurs through contamination of a cut or abrasion, although in some countries biting flies may also transmit the disease. After a 2 to 3 day incubation period, a small pimple or papule appears at the inoculation site. A surrounding ring of vesicles develops. Over the next few days, the central papule ulcerates, dries, and blackens to form the characteristic eschar. The lesion is painless and is surrounded by marked oedema that may extend for some distance. Pus and pain appear only if the lesion becomes infected by a pyogenic organism.

In most cases the disease remains limited to the initial lesion and resolves spontaneously. The main dangers are that an oedema associated with a lesion on the face or neck may become severe enough to occlude the airway. If host defences fail to contain the infection, however, fulminating septicaemia develops with a fatality rate of approximately 20% in untreated cases. A further danger is secondary meningitis. However, *Bacillus anthracis* is susceptible to penicillin and other common antibiotics, so effective treatment is usually available.

Intestinal anthrax

Intestinal anthrax is analogous to cutaneous anthrax but occurs on the intestinal mucosa. As in cutaneous anthrax, the organisms probably invade the mucosa through a pre-existing lesion. Generalised disease develops when the organisms spread from the mucosal lesion to the lymphatic system. There are no cases of this form of the disease on record in Britain.

Pulmonary anthrax

In pulmonary anthrax, inhaled spores are transported by alveolar macrophages to the mediastinal lymph nodes, where they germinate and multiply to initiate systemic disease. This is an occupational disease encountered in industries in which the workers are exposed to high levels of spores in dust, particularly in the leather and woollen industries. With improvements in industrial hygiene in the past half-century, this has become an exceedingly rare form of anthrax. Even so, most animal product processing factories offer vaccination to their workforce, particularly if the hides, wool, hair, bones and so on originate from endemic areas of the world. Gastrointestinal and pulmonary anthrax are both more dangerous than the cutaneous form because they are usually identified too late for treatment to be effective.

Further information can be found in the guidance published by the Health and Safety Executive 'Anthrax – Safe Working and Prevention of Infection' (ISBN 0-7176-14158).

Information on the collection and shipment of samples

Sample collection

- Disposable coveralls and thick kitchen-type rubber gloves should be worn and incinerated after use.
- Cuts and abrasions should be properly dressed before coveralls, gloves and boots are put on.
- Boots should be washed down with 10% formalin¹ or strong hypochlorite² (household bleach will suffice at recommended concentration >10,000ppm) after use and the disinfectant itself should be left overnight before being discarded.
- In exceedingly dusty conditions, or where dust is being collected (for example, around the inside of a disused tannery or bone processing plant), dust masks should be worn.
- Less than 500g is needed for testing, an estimate of which is **soil**: approximately the amount that would fill a soft drinks can and **plaster**: the length and breadth of a credit card.
- If the sample needs to be tested at more than one establishment, please take duplicate samples at source as samples will not be forwarded or returned once they have been tested.

Sample shipment

- Samples should be securely sealed inside a suitable container (strong plastic bag for plaster or lidded plastic pot for soil) and wiped down with disinfectant, and then securely sealed inside another strong plastic bag and disinfected again.

Please do not use glass containers or send sharps such as scalpels as these pose a serious hazard to our staff – such samples will not be processed.

- Paperwork identifying the samples and the sender must be included. Please quote any relevant PO number associated with the work.
- Once all samples have been collected and packaged, they should be placed inside of a strong box. A strong 'Jiffy Bag' (padded mailing envelope) can be used as an outer container for a small number of plaster samples.
- The box should then be packed to ensure the samples remain intact during transit and adequate absorbent material (for example paper towelling) should be used to absorb any potential spills.
- The package should then be taped up and clearly labelled '**Microbiological specimen**' and '**Only to be opened in laboratory**', as well as with both **receiver's** and **sender's** name and addresses **on the outside of the envelope**.

Samples should be addressed to:

Environmental Samples, Rare and Imported Pathogens Laboratory, UK Health Security Agency, Microbiology Services, Porton Down, Salisbury, SP4 0JG

Tel: +44 (0)1980 612348 Email: RiplEnviro@ukhsa.gov.uk

Prior to shipping the samples, email RIPLEnviro@ukhsa.gov.uk with your company details so that we can register you on our invoicing system before testing the samples.

Cost (correct for period 1 April 2025 to 31 March 2026)

To supply testing for *Bacillus anthracis* (causative agent of anthrax) and the issue of a report:
£158.32 excluding VAT per sample

Please note:

1. This quotation is valid for 60 days from date of receipt.
2. If you wish to accept this quotation, please forward an order number or letter of intent with the sample(s).
3. We will endeavour to process and report the findings within 10 working days of receipt
4. All samples are destroyed after report has been issued.
5. Samples received without a valid purchase order will not be tested.
6. Any samples not tested will incur admin or handling fee.
7. Contact RiplEnviro@ukhsa.gov.uk prior to sending non-soil or non-plaster samples.
8. For special and unusual cases or projects please contact 01980 612348 or RiplEnviro@ukhsa.gov.uk.
9. If you are sending more than 15 samples, notify prior to dispatch by emailing RiplEnviro@ukhsa.gov.uk with how many samples and the expected dispatch date. Large numbers of samples may require additional processing time beyond the stated 10-day turnaround.

¹ There are hazard and disposal issues associated with the use of formalin which must be covered by local assessment.

² This is quickly neutralised by organic material.