

Risk Assessment for Forensic Investigation of Drug-related Anthrax

This risk assessment is intended to cover police work when handling samples of heroin or other investigations associated with heroin supplies or individuals who have contracted anthrax through injecting drug use.

Source of exposure

A number of cases of anthrax have occurred in injecting drug users, with signs of infection around the injection site and of systemic infection, leading to septicaemia and death in some individuals. *Bacillus anthracis*, the causative organism of anthrax, has been isolated from the injection site and the blood of these cases and is assumed to have originated in the heroin that they used. *B. anthracis* could have been introduced at various stages during the process of manufacture or distribution. Heroin could be naturally contaminated after harvesting from contact with soil in area where an animal had died from anthrax at some point, or by stored or transported in contact with animal products, especially skins, from an animal that had died from anthrax. We have data from our investigations of other cases of anthrax suggesting that skins are contaminated occasionally in anthrax endemic areas. Skins found in the homes of drum makers associated with two recent cases have been positive for anthrax spores, and we have isolated several different strains from the stock of skins, implying a background level of contamination. The second option is that the heroin was contaminated at some stage during the cutting process. Citric acid and other common cutting agents obtained from groceries and pharmacies are very unlikely to be contaminated indeed, as their manufacturing process does not bring them into contact with sources of the organism. Of feasible agents, animal products are the most likely, and of these, bone meal would be suitable for cutting and has been associated with cases of cutaneous anthrax in people handling it in the past. In all of these cases, bone meal was imported without adequate sterilisation, something that relies on legal controls and certification at the site of origin.

The risks are therefore:

1. Contact with contaminated heroin
2. Contact with contaminated cutting agent
3. Contact with clothing or other items used by a case and contaminated with spilt heroin or cutting agent.
4. Needlestick injuries or cuts from material contaminated with infectious material (heroin or cutting agents)

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Routes of infection

Anthrax can be acquired through several different routes. The infectious form is the spore, which is very hardy and capable of surviving in the environment for long periods, and is resistant to heat, drying and many chemicals. Infection can be acquired by inhalation, by ingestion (through the mouth or in food or liquids), through cuts or abrasions in the skin. The precautions outlined here are designed to prevent infection through these routes.

Risk of infection

To be infected, personnel have to come into contact with the organisms in the heroin through one of the routes described above. The powders involved vary in consistency, but are not a fine dust like talcum powder, and are unlikely to cause a significant aerosol unless considerably disturbed by handling. An example of this would be shaking a blanket with powder on it. The drug is very precious, and is supplied only in small quantities in packets so in most cases an injecting drug user would have only a small amount in his possession and even the bulk material will be carefully controlled. We have no evidence that anyone has been infected other than by direct injection, despite the large numbers of addicts handling heroin and preparing it for injection, and none of the cases known to have handled infectious material have signs of cutaneous infection. For drug users, oral ingestion and inhalation may be possible routes of infection but again this would be deliberate intimate exposure to the infective substance. The bulk of heroin in circulation is probably free of contamination, given the relative paucity of cases, although clearly one or more contaminated lots are circulating. The advice given below on clothing levels is based upon all these considerations.

Dress and PPE for police work

The advice below is divided into various scenarios, but officers on each investigation should adapt the suggestions according to what they see on the ground. Additional advice for other situations or if personnel are exposed to suspect material can be obtained through Health Protection Scotland or HPA Porton Down (01980 612100, ask for Medical on call).

Investigation of premises associated with a known case

This covers entering a drug users room, removing samples of prepared drug, and routine searches and should cover most routine work. Staff should be dressed in "Scene of crime" protective equipment with Tyvek type suit with hood, gloves, overshoes and an FFP3 disposable face mask. After use, the individual should follow safe undressing procedure, and discard the used PPE into a bag and seal it for destruction by incineration. Samples can be transported using normal swan neck sealed and labelled forensic sample bags, such that each sample is contained in at least a primary bag or container and a second outer sealed bag (as normal practice). They should be transported off site in a dedicated forensic secure container.

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Exposed powder should be handled very carefully to avoid disturbance or raising a dust cloud. If this is not possible, staff should leave the room and return using full CBRN protective equipment and decontamination procedures.

Great care should be taken when handling or searching for sharps, which should be contained in dedicated sharps containers to avoid injury.

Investigation of premises known or suspected as having a high risk of contamination, or where significant disturbance will be caused.

This section covers circumstances where police are confident that there is a high chance of finding significant quantities of contaminated material, or where there will be considerable disruption and dust created when conducting a search, for example removing floor and wall boards.

In this scenario, staff should wear full CBRN protective gear, with safe undressing and decontamination procedures. Samples should be packed as above, but the outer bag should be placed into a further sealed bag outside the contaminated area, ensuring that this bag does not come into contact with possible sources of contamination on its outside. The outer bag must only be opened in a containment laboratory until the contents have been cleared as free of infective material.

Great care should be taken when handling or searching for sharps, which should be contained in dedicated sharps containers to avoid injury.

Disposal of clothing and effects of confirmed and suspected cases

1. The clothing should be kept in sealed plastic bags during the patient's hospital admission. If all the anthrax tests are negative, it can be returned to the patient or his relatives.
2. If the anthrax tests are positive, the situation is more complex. We have no idea what the man was wearing at the time he mixed his doses, so no evidence that any particular items the clothes involved. If the police retain his clothing as evidence, then they should be bagged as forensic specimens and the case discussed with the laboratory directly or through the outbreak control team.
3. If there is visible powder, the clothing should be examined as part of the forensic evidence chain as above.
4. Assuming that clothes are not retained by the police, if there was no visible powder on the clothes the risk is probably very small. All the cases have been exposed by direct injection, not handling the material so the level of organisms may be quite low. However, if the relatives do not want the clothes, they should be sent in the unopened bag for incineration. If they do want the clothes, they should be advised to launder them thoroughly as with all

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other clothes from the patient in a washing machine at the hottest cycle possible for the clothing.

Action if a member of staff is exposed to suspect material

1. Remove all contaminated clothing (ideally all clothing) and shower or wash with copious amounts of soap and water.
2. Dress in clean clothing.
3. Note down all circumstances of the incident, including site of exposure, type of material, action taken, time of incident and any circumstances such as cuts, abrasions or Needlestick injuries.
4. Seek medical advice immediately. Specialist medical support for attending physicians is available from Dr Tim Brooks (07766 775149) or Dr Bob Spencer (07885 434000).

Additional information

Reference laboratory:

Special Pathogens Reference Unit

Health Protection Agency

Centre for Emergency Preparedness & Response

Porton Down

Salisbury

SP4 ONU

Working hours 01980 612348

Out of hours: 01980 612100. Ask for Special pathogens on call (technical staff) or Medical on call.

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