
Anthrax

Frequently Asked Questions

1. What is anthrax?

Anthrax is an acute infectious disease caused by the bacterium *Bacillus anthracis*. *Bacillus anthracis* produces dormant spores which can stay in the environment for decades and are activated into growing bacteria upon entry into an animal or human body. Anthrax spores have been used as agent of biological warfare.

2. Who can get anthrax?

Anthrax primarily infects herbivores. The disease is most common in cattle, goat, sheep and antelopes. Humans get infected when exposed to the bacterial spores in the environment, or infected animals, through contact with infected animals or contaminated animal products. Cases have been reported worldwide, but veterinarians, livestock producers, those who slaughter animals or handle meat products and laboratory staff are at higher risk of acquiring the disease.

3. Where does anthrax occur in South Africa?

Anthrax is endemic in most sub-Saharan African countries. In South Africa, the exact incidence of anthrax in human is unknown. There have been 100 suspected human cases in South Africa from 2005 to 2014, but only three have been laboratory confirmed. Sporadic point outbreaks in animals are common in the Northern Cape Province and the northern Kruger National Park (KNP). Outbreaks have occurred during 2006 to 2009 and again during 2010 to 2014 in Northern Cape. At least nine major outbreaks have occurred in KNP since the 1960s. There have not been reports of anthrax spore usage as an agent of biological warfare in South Africa.

4. How is anthrax transmitted?

Anthrax is not contagious and person to person transmission is rare. There are four forms of anthrax relating to the route of exposure. Cutaneous anthrax, the most common form in humans is acquired through skin cuts or abrasions. Gastrointestinal anthrax is acquired through ingestion of contaminated food, usually meat from an infected animal. Inhalation anthrax is acquired through breathing in airborne *Bacillus anthracis* spores; it causes most severe illness as compared to other forms. Injection anthrax is a newly recognised form that is associated with intravenous drug use.

5. How does anthrax affect animals?

Depending on the animal species and route of exposure, the incubation period ranges from a few hours to 8 days. Symptoms may include febrile illness and swelling of the submandibular fossa, followed by irritability, loss of appetite, difficulty breathing, coma and death due to shock. In South Africa, a total of 30 hippos died due to anthrax during an outbreak which started in 2010, while several wildlife species including impala, kudu and Burchell's zebra were affected during an outbreak in 2014.

6. **What are the signs and symptoms of anthrax?**

In humans, the incubation period ranges between 2-7 days. Cutaneous anthrax begins as a raised itchy bump on the skin. After 1-2 days this develops into a vesicle and then a painless ulcer. The ulcer is surrounded by black necrotic tissue (eschar) with oedema (swelling). Healing is spontaneous although 10–20% of untreated cutaneous cases may lead to death. Inhalation anthrax starts with symptoms of a common cold and progresses to severe respiratory disease with shock which is usually fatal in 75% of cases. Intestinal anthrax begins with nausea, loss of appetite, vomiting and fever, followed by abdominal pain, vomiting of blood and severe diarrhoea.

7. **How is anthrax diagnosed?**

Confirmation of infection with *Bacillus anthracis* is through isolation of the bacterium from blood, cerebrospinal fluid, skin lesion swab or respiratory secretions by culture or PCR *Bacillus anthracis* DNA. Specimens should be collected in a sterile container and sent for testing (before treatment). The Centre for Emerging and Zoonotic Diseases (NICD-NHLS) is the only laboratory in South Africa that provides anthrax testing on human samples.

8. **How is anthrax treated?**

Antimicrobial treatment of anthrax depends on the type and disease severity. Ciprofloxacin or doxycycline are used as first line-treatment. Oral and intravenous regimens are given for mild and severe cases, respectively. Penicillin regimes may be used when antimicrobial testing confirms penicillin susceptibility. Cases showing signs of meningitis development should be given additional antibiotics such as vancomycin, imipenem or meropenem, chloramphenicol, rifampicin and clarithromycin.

9. **How can anthrax be prevented?**

Routine vaccination of livestock is the most effective preventive measure against anthrax. Ciprofloxacin and doxycycline may be used as prophylaxis following suspected or proven anthrax exposure. Antibiotics should be taken for 60 days to ensure protection from anthrax spores that may activate in the body.

10. **Where can I find out more information**

- Medical/clinical related queries: NICD Hotline +27 82 883 9920 (for use by healthcare professionals only)
- Laboratory related queries:
 - Centre for Emerging and Zoonotic Diseases, Special Bacterial Pathogens Laboratory: (Tel)+27 11 555 0306
 - Dr Jenny Rossouw: (Tel) +27 11 555 0331, jennyr@nicd.ac.za