

Anthrax

A PowerPage Presented By



Anthrax is a **reportable, zoonotic** disease caused by the Gram-positive rod bacteria, *Bacillus anthracis*. Anthrax affects domestic and wild animals and secondarily, humans. This PowerPage discusses the important features of *Bacillus anthracis* that are likely to come up on boards and the important aspects of identification and prevention of the disease.

Key Features:

- **Spores** are resistant to heat, drying, and many disinfectants
- **Bloody discharge** from orifices, **absence of rigor mortis**, rapid **bloating**, **dark blood that does not clot**
- **Do not open the carcass** of an Anthrax suspect for necropsy
- Zoonotic and reportable

Etiologic Agent

- *Bacillus anthracis*
 - Aerobic, **Gram-positive**, spore-forming rod
 - Spore is dehydrated with thick walls; can remain inactive for decades. Also called an endospore
 - Spores are **resistant to heat, drying, and many disinfectants**
 - Typically infects herbivores. Cattle, sheep, and goats most frequently
 - Spores germinate in animal host and grow rapidly in the vegetative form, causing a fatal septicemia

Clinical Signs and Diagnosis

- Often, acute death is all that is seen in peracute forms but may be preceded by:
 - Staggering
 - Convulsions
 - High fever
 - Extensive swelling
 - Cardiac or respiratory distress
 - Depression/stupor
- Key findings (if you see these, you should definitely think of Anthrax)
 - **Bloody discharge from the nose, mouth, or anus**
 - **Absence of rigor mortis**
 - **Rapid bloating**
 - **Dark blood that does not clot**
- Diagnosis can be confirmed by:
 - If anthrax is suspected, **do not perform a necropsy**
 - A blood or tissue sample should be submitted in accordance with the procedures of the diagnostic lab (contact them first)

Public Health and Prevention

Control and Prevention

- Rapid detection, reporting and quarantine are key to prevention
- Vaccination is effective
 - Given annually in endemic areas
- Post-exposure prophylaxis of asymptomatic animals helps control disease when seen in a herd
- Suspect animals should be buried (or burned) without opening the carcass and without moving the animal, which may spread the bacteria
 - Opening the carcass will cause the more fragile vegetative bacteria to form resistant spores

Forms of the Disease in Humans

- Cutaneous Anthrax - ~95% of cases
 - Enters through a break in the skin
 - Begins as a papule, progresses to a vesicle, then ulcerates
 - Extensive edema around lesions may be seen
 - A black **eschar** forms
 - Cutaneous infections can rarely become systemic
- GI anthrax - rare
 - Usually from consumption of contaminated meat
 - Oropharyngeal disease begins with a severe sore throat and/or ulcerations with neck swelling
 - GI disease may cause anorexia, vomiting, abdominal pain, hemorrhagic diarrhea
 - May become systemic and fatal
- Inhalational anthrax
 - From breathing in the organism
 - Severe respiratory disease with near 100% mortality
 - Flu-like symptoms progressing to massive bacteremia and shock
 - Antibiotics will kill the organism but not the bacillus exotoxins and death within 2-3 days is common

Treatment

Early antibiotic treatment is essential. **Ciprofloxacin**, doxycycline, and penicillins are appropriate antibiotics. Extended treatment, **usually 60 days** is indicated to completely eradicate the organism.

