

Anthrax (*Bacillus anthracis*)

DISEASE IN ANIMALS

Bacillus anthracis is a bacterium that forms anthrax spores when exposed to air. These spores are highly resistant to physical and chemical agents and can survive for decades in contaminated soils. Species most affected are goats, sheep, cattle and horses. Anthrax has also been observed in pigs, mink, cats and dogs that have been fed contaminated meat, but these species are somewhat resistant to the disease and frequently recover. Anthrax is enzootic in the western states. Alkaline soils favor spore survival. Periodic outbreaks frequently follow flooding which brings the spores to the surface. The last animal outbreak in Ohio occurred in 1952 and was linked to contaminated swine feed. This is a potential bioterrorism agent.

Reporting: This is a reportable animal disease in Ohio and all suspected cases must be reported to the Ohio Department of Agriculture (ODA), Division of Animal Industry at (614) 728-6220 or (800)-300-9755 or the USDA APHIS Veterinary Services at (614) 856-4735 or (800) 536-7593.

Transmission: Ingestion, inhalation or cutaneous penetration of spores from infected animal carcasses, animal products or contaminated water or soil

Clinical signs: Anthrax most commonly presents as a rapidly fatal septicemia. Post-mortem signs include rapid bloating, failure of rigor mortis, dark blood from body orifices and failure of blood to clot. The body decomposes rapidly.

Ante mortem signs include fever (107°F), enlarged lymph nodes and localized, subcutaneous, edematous swelling that can be quite extensive along the ventral neck, thorax, and shoulders. Abortion, reduced milk production, and colic have also been reported.

Suspected animals should not be necropsied, as exposure to air results in spore formation. Restrict human and animal contact with suspected sources of anthrax. Consult ODA immediately for advice on decontamination and disposal of contaminated carcasses. See personal protection (below)

Diagnostics: Preferred sample is an ear, which is cut off and sent to the lab. Serology is rarely useful. Laboratory diagnostics may include:

- Cytology: *B. anthracis* may be visible on a blood smear stained with polychrome methylene blue
- Culture: blood, tissues or contaminated soil
- Immunofluorescence: *B. anthracis* demonstrated in a clinical specimen
- Thermoprecipitin test: on decomposed tissue

Case classification:

- Suspected: a clinical case with signs consistent with anthrax
- Probable: a clinically suspect case with laboratory evidence from a screening or unvalidated test
- Confirmed: a case that meets confirmatory testing criteria determined by a state or federal diagnostic laboratory

DISEASE IN HUMANS

Reporting: Report immediately via telephone a human case or suspected case and/or a positive laboratory result to the [local health department](#) (LHD) where the patient resides. If unknown, report immediately to the LHD within the jurisdiction of the health facility or ODH.

Human illness: Symptoms vary with route of exposure.

Cutaneous anthrax is the most common form. It begins as a painless skin lesion developing over two to six days from a papular through a vesicular stage into a depressed black eschar with surrounding edema. Fever, malaise and lymphadenopathy may accompany the lesion.

Inhalation anthrax initially resembles a viral respiratory illness, followed by hypoxia, dyspnea or acute respiratory distress with resulting cyanosis and shock. Mortality rate is 80% to 100%.

Symptoms of gastrointestinal anthrax include an acute onset of severe abdominal pain and tenderness, nausea, vomiting, hematemesis, bloody diarrhea, anorexia, fever, abdominal swelling and septicemia.

Oropharyngeal anthrax is described as a painless mucosal lesion in the oral cavity or oropharynx, with cervical adenopathy, edema, pharyngitis, fever, and possibly septicemia.

Symptoms of meningeal anthrax include fever, convulsions, coma, or meningeal signs. Signs of another form will likely be evident as this syndrome is usually secondary to the above syndromes.

Personal protection: Anthrax can be transmitted through contact with infected carcasses and bloody discharge from infected animals. Skin and wool can contain spores that can remain infective for decades. Suspected animals should not be necropsied as exposure to air results in spore formation. Personal protective equipment should cover exposed skin and prevent inhalation. Non-porous gloves, eye protection, and a properly fitted respirator with P-type or better filter are recommended.

Restrict human and animal contact with suspected sources of anthrax. Consult ODA for advice on decontamination and disposal of contaminated carcasses.

[FOR MORE INFORMATION](#)

Disease in Animals

[ODA Division of Animal Industry](#)

[AVMA Public Health Disease Information](#)

[OIE Manual of Diagnostic Tests](#)

[ABCs of bioterrorism for veterinarians, Category A agents, JAVMA pdf](#)

[Iowa State University Center for Food Security and Public Health Animal Disease Factsheets](#)

Disease in Humans

[ODH Infectious Disease Control Manual](#)

[CDC Bioterrorism Agents / Anthrax](#)

[CIDRAP Anthrax](#)