

September 15, 1997

## The Black Bane is Back

*Anthrax is an acute bacterial disease primarily of herbivores. These animals acquire infection by coming into contact with soil-borne Bacillus anthracis spores. Anthrax only incidentally infects humans who come into contact with infected animals or their products. The etiologic agent is a large Gram-positive spore-forming bacillus that can cause acute infection in both animals and humans. In its spore form, B. anthracis can persist in nature for prolonged periods, possibly years.*

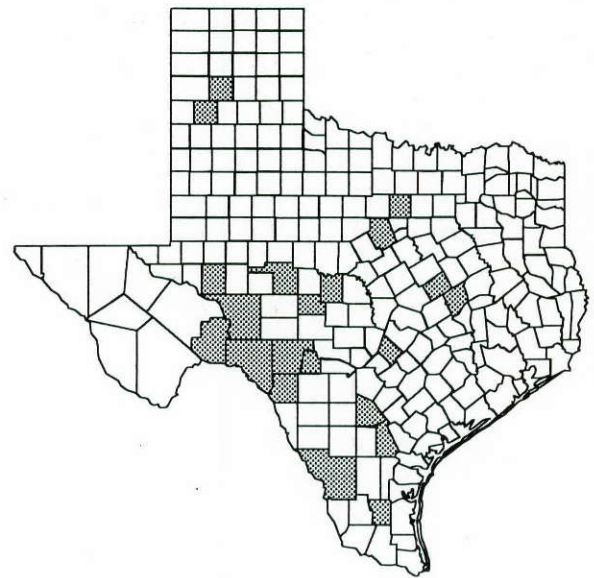
*Anthrax spores are uniquely suited to be used as biological weapons in "germ warfare"; at least 10 nations have the capability to produce, store, and load B. anthracis spores into weapons.*

### Animal Anthrax

**A**nthrax in animals can take 3 forms: apoplectic, acute/subacute, and chronic. The apoplectic form is seen mostly in cattle, sheep, and goats; it occurs most frequently at the beginning of an outbreak. Animals show signs of cerebral apoplexy, and death is sudden. The acute and subacute forms are common in cattle, horses, and sheep. Signs include fever, ruminal stasis, excitement followed by depression, difficulty in breathing, uncoordinated movements, convulsions, and death. Unclotted blood issuing from body orifices, rapid decomposition of the carcass, and incomplete rigor mortis are often observed. Chronic anthrax, characterized by pharyngeal and lingual edema and a foamy discharge from the mouth, occurs mainly in less susceptible species such as pigs, but may also be seen in cattle, horses, and dogs.<sup>1</sup>

When anthrax is suspected in an herbivore (ie, sudden death, rapid bloating, incomplete rigor mortis, blood exuding from orifices), necropsy is contraindicated. An enormous number of *B. anthracis* spores are produced in an animal dying of anthrax, and any spores that are released can contaminate the environment as well as infect humans handling the animal's body parts. Instead of performing a necropsy, a blood sample should be submitted by overnight mail to Texas Veterinary Medical Diagnostic Laboratory (TVMDL), 1 Sippel Road, College Station, TX 77843, (409) 845-3414. Extreme care should be taken not to spill any of the sample.

Figure 1. Confirmed Cases of Animal Anthrax in Texas, by County, 1979-1997



When anthrax is detected in Texas livestock, the Texas Animal Health Commission works with the herd owner to vaccinate all susceptible animals. After vaccination, the herd and

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premises are placed under quarantine for 10 days. Any animals showing signs of anthrax should be treated with penicillin or tetracycline and should not be used for food until a few months have passed after the cessation of treatment.

Carcasses of infected animals should not be moved and must be disposed of properly to prevent further environmental contamination. According to Texas law, carcasses must be burned until thoroughly consumed (Texas Administrative Code, Title 4, Part II, §31.3).

Animal anthrax is enzootic in Texas with infrequent, sporadic cases occurring annually in livestock. Because of the expense, blood from only one animal is usually submitted for testing. Therefore, single cases of laboratory-confirmed anthrax often represent outbreaks. Figure 1 shows the county location of animal anthrax cases (outbreaks) in Texas since 1979. These incidents have involved cattle, sheep, horses, goats, and deer. From 1979 to present, 56 separate incidents of animal anthrax have been confirmed in Texas (data from Texas Veterinary Medical Diagnostic Laboratory, College Station, Texas). No animal anthrax was reported in 1996. However, 5 cases have been confirmed by TVMDL in 1997.

Figure 2. Cutaneous anthrax



The first laboratory confirmation in 1997 was in a Terrell County goat (see accompanying story). The next 4 cases were confirmed in rapid succession in July in Kinney, Val Verde, Edwards, and Parker Counties. In Kinney County, after observing a large number of dead, decomposed white-tailed deer over several weeks, a rancher submitted specimens from a deer that had recently died; anthrax was confirmed. Although studies have shown that anthrax is endemic in Texas deer, it is rarely diagnosed since most deaths go unnoticed by humans. However, there have been recent anecdotes of deer die-offs in South Texas; the animals purportedly have had signs consistent with anthrax.

Anthrax was confirmed on a ranch in northern Val Verde County after two cows and one bull suddenly died. A few days later, another cow was diagnosed in Edwards County. The fifth incident occurred 300 miles to the northeast in Parker County. Because anthrax was not suspected when one of 40 cows died, no precautionary measures were taken. There were several opportunities for human exposure as well as for sporulation and spread of spores. First, the animal was necropsied. Later the carcass was sent to a rendering plant.

### Human Anthrax

Human anthrax, which has an incubation period of 2 to 5 days, is classified according to the site of bacteria or spore infection. Cutaneous anthrax results from direct contact (commonly on the arms or hands) with infected tissue or spores. Cases most often occur in industrial or agricultural settings. In the agricultural environment, cases result from direct contact with animals that have died from anthrax. Industrial cases result from contact with anthrax spores that have contaminated raw manufacturing materials such as imported wool, animal hair, and bones. Approximately 95% of anthrax cases in developed countries are cutaneous.

*Continued* ☞

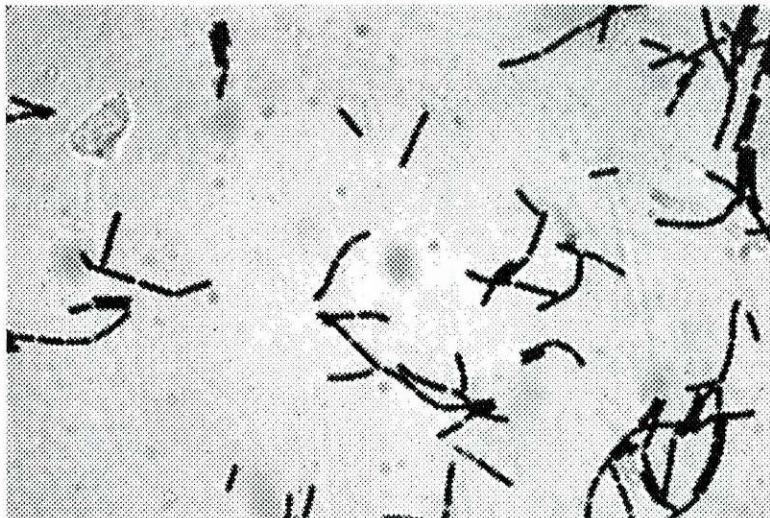
Cutaneous anthrax begins as a painless pruritic papule that resembles an insect bite. The papule enlarges and within 1 or 2 days develops into an ulcer surrounded by vesicles. A characteristic black necrotic central eschar (tissue in the process of separating from viable portions of the body) appears later with associated edema (Figure 2). Even with early effective therapy, the lesion will finish forming fully. Five to 20 percent of patients with untreated cutaneous anthrax develop septicemia and generalized infection resulting in death. Deaths are rare, however, with antimicrobial treatment.

Pulmonary anthrax (wool sorters' disease) results from inhalation of dust particles containing spores released during risky industrial processes such as tanning of hides, or processing of wool or bone. Initial symptoms are mild and nonspecific, resembling a common upper respiratory infection. Acute symptoms of respiratory distress, fever, profuse sweating, cyanosis, and shock follow in 3 to 5 days with death shortly thereafter. The fatality rate is 85% even with treatment. Autopsy usually reveals extensive necrotic hemorrhagic mediastinitis.

Gastrointestinal anthrax, which may present with either oropharyngeal or abdominal symptoms, is usually contracted through the ingestion of contaminated meat; there is no evidence that the *B. anthracis* is contracted by consuming milk of infected animals.<sup>2</sup> Gastrointestinal anthrax is rare and difficult to recognize and tends to occur in explosive outbreaks. Oropharyngeal anthrax usually presents with sore throat, dysphagia, fever, and regional lymphadenopathy followed by toxemia. Abdominal infections are manifested by nausea, vomiting, and fever, followed by bloody diarrhea and signs of bacteremia such as shock and cyanosis; death is the usual outcome.

Pulmonary or gastrointestinal anthrax should be treated with penicillin G, 4 million units intravenously every 4 to 6 hours. Cutaneous anthrax may be

Figure 3. Gram stain from *B. anthracis* culture



treated with ciprofloxacin, 750 mg orally twice a day or doxycycline, 100 mg orally twice a day. Alternatively, cutaneous anthrax may be treated with erythromycin, 500 mg orally 4 times a day. Treatment should generally extend for 7 to 10 days, although prolonged treatment may be required.

Dressings that have been used to cover lesions of cutaneous cases should be incinerated, autoclaved, or disposed of as biohazardous waste. A vaccine is available for persons at high risk of exposure such as laboratorians who routinely work with *B. anthracis* or workers handling potentially contaminated industrial raw materials. The anthrax vaccine consists of a series of 6 doses with yearly boosters. The first inoculation must be given at least 4 weeks prior to exposure.

Health care providers should obtain a CBC, blood cultures, and red-top tube for serologic tests on each suspected human anthrax case. A Gram stain is often diagnostic and should be performed on material from all cutaneous lesions. (Figure 3 shows a Gram stain from a *B. anthracis* blood culture.)

From 1944 through 1983, 755 human cases were reported in the United States.<sup>4</sup> Only 5 cases have been reported since 1983; the incidence dramatically de-

creased as routine animal vaccination in enzootic areas increased. Twenty-three cases of human anthrax dating back to 1946 have been reported in Texas. The most recent Texas case occurred almost a decade ago (December, 1988) in a 63-year-old sheep shearer from Uvalde County. The shearer, who had a history of performing necropsies on sheep, was hospitalized with a necrotic lesion on his left forearm accompanied by arm pain, edema, and regional lymphadenopathy.<sup>5</sup> The patient was treated with penicillin G (600,000 units IV every 6 hours) for 4 days. He was then discharged from the hospital with oral penicillin V, 500 mg 4 times daily, for an additional 10 days. He recovered completely.



**Prepared by** Jane Mahlow, DVM, MS, TDH Zoonosis Control Division; Julie Rawlings, MPH, Infectious Disease Epidemiology and Surveillance Division; and Jennifer Tisch,

Student Intern, Infectious Disease Epidemiology and Surveillance Division.

*Photographs courtesy of Kate Hendricks, MD, MPH&TM (Zimbabwe, 1985)*

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2. Benenson, AS: *Control of Communicable Diseases Manual*. Washington, D.C., American Public Health Association, 16th Ed, 1995, pp 19-20.
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## National Adult Immunization Awareness Week: October 12-18

The national Healthy People 2000 goal is for at least 60% of America's adult population to be immunized against vaccine-preventable diseases. Adult vaccinations are currently available to protect against influenza, pneumococcal pneumonia, hepatitis A and B, measles, mumps, rubella, varicella, tetanus, and diphtheria.

The National Coalition for Adult Immunization is offering 1997 Campaign Kits for use in promoting National Adult Immunization Awareness Week in the community. The kit includes the following education resources for health care workers and the public: adult immunization schedule, poster, contact lists, fact sheets, guide to promotional activities, guide to writing low literacy materials, list of vaccine manufacturers, and standards for adult immunization practice.

The 1997 Campaign Kit costs only \$10.95, and all materials may be reproduced or modified as needed. Such diverse groups as medical associations, universities, churches, and local health departments have conducted effective adult immunization activities using the Coalition's immunization materials. You can order kits from

The National Coalition for Adult Immunization  
4733 Bethesda Avenue, Suite 750  
Bethesda, MD 20814-5228

Include your name, organization, shipping address, number of kits desired, and a check for the total amount. **Request must include check and be postmarked by October 13, 1997.** For additional information regarding adult immunization, contact the Texas Department of Health Immunization Division at (800) 252-9152.

## Anthrax in a Terrell County Goat

"Behold, the Hand of the Lord will be on your cattle in the field, on the horses, on the donkeys, on the camels, on the oxen and on the sheep -- a very severe pestilence."

"...and all of the livestock of Egypt died."

"...and it will cause boils that break out in sores on man and beast throughout all the land of Egypt."

Exodus 9:3, 6, 9.

Many centuries have passed since the 5th and 6th Plagues were inflicted upon the captors of the Israelites. In spite of dramatic advances in science since those Biblical times, anthrax continues to be a threat to human and animal health.

First suspected by a Terrell County agricultural extension agent, anthrax was diagnosed by the Texas Veterinary Medical Diagnostic Laboratory as the cause of death of a goat on a large Terrell County ranch. On July 10, 1997, shortly after learning of the diagnosis, the extension agent notified the Texas Department of Health of the case. To determine the extent of possible human exposures, TDH staff interviewed the ranch family that evening. According to the ranchers, in the month prior to this diagnosis, approximately 90 sheep, cattle, and goats on the ranch had died of an undetermined cause. Because the animals had been suspected of consuming poisonous plants, 1 of 3 ranch workers had cut open a dead goat's stomach to examine the contents. Inadequate protective measures were used during the partial necropsy. A second worker handled the carcass of the infected goat with bare hands when placing it in a home freezer.

When asked whether they had been ill, the ranch family stated that during the week before anthrax was diagnosed in the goat, one of them had experienced headaches and a fever. Another had a gastrointestinal illness with diarrhea. Upon being informed of the various types of human anthrax and the usual modes of presentation, the family and ranch workers decided to drive 100 miles to the nearest medical clinic for testing.

After consulting with TDH staff, the physician's assistant (PA) who saw them late that evening collected blood for serologic tests and complete blood counts (CBCs). According to the PA, none of the 3 appeared ill, and all of the CBCs were normal. All 3 ranch hands elected to prophylactically take the ciprofloxacin prescribed that evening. None became ill. Serum was sent to the United States Army Medical Research Institute for Infectious Diseases (USAMRIID). The antibody titers were negative.

The same ranch had experienced an anthrax episode approximately 20 to 25 years previously. That owner had subsequently vaccinated all livestock annually. The ranch was sold 17 years ago to the present owners and vaccination was not continued.

During the preceding 4-year drought, the ranch livestock grazed the forage down to ground level. As a result of markedly increased rainfall during the winter and early spring of 1997, the grasses grew very rapidly. It is possible that the surface of the vegetation had soil particles containing *B. anthracis* spores that were ingested by the livestock.

The carcasses of the dead livestock on the Terrell County ranch were destroyed by burning, accomplished with old tires and diesel fuel. The current situation on the ranch has been brought under control through the vaccination of all remaining livestock; however, *B. anthracis* will remain a threat to the ranch residents and livestock for the foreseeable future.

**Prepared by** Evret C. Newman, DVM; Regional Veterinarian, Texas Department of Health, Public Health Region 9/10.

## TDH Investigates *Yersinia Enterocolitica* Infections in Infants

The Texas Department of Health is investigating reports of prolonged and bloody diarrhea in infants. Since May 1, 1997, cases of diarrhea have been reported in 16 infants and toddlers aged 1 to 16 months old. All of these children had diarrhea lasting 5 or more days, with the average duration of illness lasting 14 days (range 5 to 30 days). Eight babies had bloody diarrhea, 6 of these had vomiting; 7 had fevers of 101°F or higher. *Yersinia enterocolitica* was cultured from the stools of 7 infants by the TDH lab and by hospital laboratories in Dallas and Lubbock.

*Yersinia enterocolitica* is a small rod-shaped, Gram-negative bacterium that causes severe abdominal pain and symptoms that mimic acute appendicitis in older adolescents and adults. In young children and infants, *Yersinia* can be an important cause of severe gastroenteritis. The epidemiology of *Y. enterocolitica* is poorly understood. A recent review of the literature suggests seasonal variation with more cases occurring in warm weather months. The CDC estimates that as many as 17,000 cases of illness occur each year. Most cases are not diagnosed because few laboratories test for the bacteria in routine stool cultures, and yersiniosis is not a reportable condition in many states. Outbreaks have been associated with pasteurized milk products, chocolate

milk, and tofu prepared with non chlorinated water contaminated with the bacteria. Infection occurs when someone ingests food or beverages contaminated with the bacteria. There seems to be little person-to-person spread of the disease. The incubation period is from 1 to 7 days, with most illnesses occurring within 48 hours of becoming infected.

TDH is asking any physician who sees an infant with bloody diarrhea or diarrhea lasting 5 or more days to consider the diagnosis. Culture media routinely used for other Gram-negative bacteria is suboptimal for isolating *Y. enterocolitica*. Physicians should request specific cultures for *Yersinia* from commercial laboratories or submit stool for enteric cultures to the TDH lab in Austin. Specimens submitted to TDH should be accompanied by a lab submission form (G-1). Isolates should be saved for submission to the TDH laboratory for pulsed-field gel electrophoresis.

To report cases for the current investigation, get G-1 forms to submit enteric cultures, or submit isolates, please call the Infectious Disease Epidemiology and Surveillance Division at 1-800-252-8239, press 1.

**Prepared by** David Bergmire-Sweat, MPH, TDH Infectious Disease Epidemiology and Surveillance Division.

## Creutzfeldt-Jakob Disease

Creutzfeldt-Jakob disease (CJD) is a rare brain disorder characterized by rapidly progressive dementia, variable ataxia, myoclonus, and a variable spectrum of other neurologic signs. The average patient age is 65, and the duration of illness prior to death is 3 to 12 months. Sporadic CJD accounts for 85% of cases, while 10 to 15% of cases are inherited. There have been rare instances of CJD transmission through exposure to contaminated surgical instruments, dura mater grafts, and human pituitary-derived growth hormone. In 1995, a new strain of CJD (nv-CJD) was recognized in Britain; it appears to affect primarily younger people and progresses more slowly than the classic variety. To date, there are 21 documented cases of nv-CJD in Europe. The following is a current summary of Texas Department of Health (TDH) CJD surveillance activities in Texas.

The normal mortality rate for CJD worldwide is 1 death/million population/year. In June 1996, TDH published a study of CJD mortality in Texas for the years 1984 through 1994. There was an average of 10 deaths per year (range = 1 to 14 deaths/year), for an average yearly mortality rate of 0.76 deaths/million population. In 1995 CJD was listed as the immediate or underlying cause for 17 deaths, and in 1996 the number was 18. Texas has a population of nearly 19 million, so the rate for each of the past 2 years was just under 1 death/million population/year.

Also in 1996, at the request of the Centers for Disease Control and Prevention, TDH began tracking CJD in persons under the age of 56. To date 6 cases have been investigated; all appear to be classic CJD.

In April 1997, TDH became aware of a larger-than-expected number of possible CJD cases in Public Health Region 4. Region 4, with a population of just over 1 million, comprises 23 counties in northeast Texas. In response, TDH searched death certificates and asked area infection control practitioners and neuropathologists at medical schools to search their data bases for recent cases. All area neurologists, neurosurgeons, and pathologists were asked to report suspect cases of CJD. After review of medical records and autopsy and biopsy results of the reported cases, 3 patients were identified with definite classic CJD (based on neuropathology), and 4 were identified with probable CJD. Dates of death for the 7 patients were from April, 1996 through mid-July 1997. The patients were from 46 through 65 years of age; 3 were male, and 4 were female.

Currently TDH is requesting that the Board of Health make CJD a reportable disease and encouraging autopsies for CJD patients since this is presently the only definitive way to differentiate classic CJD from nv-CJD. Surveillance has been expanded to include the whole state and all age groups from 1990 to the present. A comprehensive questionnaire, to be administered to patients' relatives, is being developed in order to assess the risk for CJD in Texas.

**Prepared by** Julie Rawlings, MPH, Infectious Disease Epidemiology and Surveillance Division and Meredith Barad, Student Intern, Infectious Disease Epidemiology and Surveillance Division.



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<http://www.tdh.state.tx.us/phpep/dpnhome.htm>  
TDH Healthy Texans BBS: (800) 858-5833

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