



Human Anthrax Associated With an Epizootic Among Livestock—North Dakota, 2000

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ON AUGUST 28, 2000, THE NORTH DAKOTA Department of Health was notified by a local clinician of a patient with a cutaneous lesion suggestive of anthrax following exposure to an infected animal carcass. This report summarizes the investigation of this case, which was associated with an anthrax epizootic among livestock in North Dakota, and emphasizes the importance of increased vigilance for human cases of anthrax during and following outbreaks of anthrax among livestock.

On August 19, 2000, a 67-year-old resident of eastern North Dakota participated in the disposal of five cows that had died of anthrax. On the day of disposal, he placed chains around the heads and hooves of the animals and moved them to a burial site. He reported having worn leather gloves throughout transportation and disposal.

On August 23, he noticed a small bump on his left cheek at the angle of his jaw. On August 25, the lesion had enlarged and he sought medical attention. He denied fever, malaise, headache, pruritus, or difficulty swallowing. On examination, the lesion was indurated to approximately the size of a quarter and was surrounded by a purple colored ring. The patient was afebrile and did not appear ill. The physician reported a firm, nontender, superficial nodule with an overlying 0.5 cm black eschar. No drainage was noted and neither wound nor blood cultures was obtained. The patient was placed on

ciprofloxacin 500 mg twice a day for presumed cutaneous anthrax.

On follow-up examination on August 28, the eschar had enlarged to 1 cm. Following consultation with the North Dakota Department of Health and based on clinical suspicion of anthrax, the patient continued the course of ciprofloxacin for a total of 14 days. The lesion slowly improved over several weeks. Paired serum specimens were obtained on September 22 and October 5, 2000, and were tested at CDC; both had positive antibody titers by ELISA of 200 to protective antigen, confirming infection with *Bacillus anthracis*.

This case was associated with an anthrax epizootic in North Dakota, during which 32 farms were quarantined for anthrax in 2000,* compared with an average of two farms per year during the preceding 40 years. The initial cases were detected in May 2000, when four animals were found dead on a farm; the deaths were later confirmed to be associated with anthrax. During the epizootic, which extended from July 6 through September 24, 2000, 157 animals died on 31 farms on which 62 persons were involved with animal care, vaccination, specimen processing, or carcass disposal. No other cases of symptomatic anthrax were identified in humans in North Dakota.

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CDC Editorial Note: This report presents the first case of cutaneous anthrax in the United States since 1992. In the United States, the annual incidence of human anthrax declined from approximately 200 cases in the early 1900s to no human cases since 1992. Although most cases reported in the United States have been cutaneous, 18 cases of inhalational anthrax were reported during the

20th century, most recently in 1976.¹ No cases of gastrointestinal anthrax have been reported in the United States.

Anthrax most commonly occurs in both wild and domestic mammals (e.g., cattle, sheep, goats, camels, antelopes, and other herbivores).² Humans develop anthrax infection following exposure to infected animals, tissue from infected animals, or by direct exposure to *B. anthracis*.^{3,4} Exposure to infected animal tissue can occur during postmortem examination, slaughter, or handling of infected meat or hides. Exposure also can occur during laboratory manipulation of infected blood, muscle, or other tissues. Human-to-human transmission of anthrax is rare.

Anthrax can occur in three forms: cutaneous, gastrointestinal, and inhalational.² Most cases (95% worldwide) are cutaneous. The incubation period for cutaneous anthrax ranges from 12 hours to 12 days.^{2,5} Cutaneous anthrax may begin with pruritus at the affected site, typically followed by a small, painless papule that progresses to a vesicle in 1-2 days. The lesion erodes, leaving a necrotic ulcer with a characteristic black center. Secondary vesicles are sometimes observed, lymphadenopathy may occur, and local edema may be extensive. Patients may have fever, malaise, and headache. The most common sites of cutaneous anthrax are the hands, forearms, and head. Of the 203 cases reported in the United States since 1955 in which the site of infection was known, 64 (27%) have been in the head and neck region.² Presumably, the mechanism of inoculation in this case was the transfer of infective spores on the patient's gloves to broken skin on his face.

Untreated, 20% of persons with cutaneous anthrax die, compared with <1% of those who receive antibiotic therapy.^{2,6} *B. anthracis* is sensitive *in vitro* to penicillin, tetracycline, chloramphenicol, and ciprofloxacin.⁷ In localized or uncomplicated cases of cutaneous anthrax, the recommended regimen is



penicillin V, 500 mg taken orally every 6 hours for 5-7 days. For more severe cases of cutaneous anthrax, penicillin G, 4-6 million units every 6 hours intravenously for 7-10 days is recommended. Doxycycline, 100 mg twice a day for localized cases or intravenously for serious cases, also can be used.⁷⁻⁹

Veterinarians and agricultural workers should minimize direct contact with animals suspected to have died of anthrax. For confirmation by smear or culture, the carcass should not be opened, and a postmortem blood sample should be obtained aseptically by a veterinarian from an accessible peripheral vein (e.g., jugular vein). Specimens also can be obtained from hemorrhagic nasal, buccal, or anal exudate or from materials contaminated with the exudate. If possible, the carcass should be burned or buried where it is found. To minimize environmental contamination, burning is the preferred disposal method. Bedding and other materials found around the carcass (e.g., contaminated soil) also should be burned or buried, and all remaining animals should be promptly removed from the affected pasture. Farms where anthrax deaths among livestock are confirmed should be quarantined and all susceptible healthy livestock on the affected and neighboring premises vaccinated with the Sterne vaccine. Where anthrax is suspected or confirmed, use of long-acting antibiotics followed by vaccination may be effective in reducing livestock deaths. However, this regimen has not been systematically evaluated.

Because this epizootic may continue in North Dakota and because anthrax cases among livestock occur each year, health-care providers should consider the possibility of anthrax when evaluating patients with characteristic skin lesions, particularly if the exposure history includes handling of animals with confirmed or suspected anthrax. Vigilance for human cases of anthrax should be heightened during anthrax epizootics. Veterinary health services should work closely with public and private health officials to ensure early detection and treatment of possible human anthrax cases resulting from exposure

to animals during an epizootic. Any person who handles carcasses of animals that have died or are suspected to have died of anthrax should contact their health-care provider if they develop a skin lesion. Although veterinarians, agricultural workers, and laboratory workers might be at increased risk for *B. anthracis* infection during these epizootics, the risk is low and anthrax vaccination is not recommended.¹⁰

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10 available

*A quarantined farm is one on which at least one case of culture-confirmed anthrax has occurred among livestock.

†All MMWR references are available on the Internet at <http://www.cdc.gov/mmwr>. Use the search function to find specific articles.

Draft of Guidelines for the Prevention of Opportunistic Infections (OIs) in Persons Infected With Human Immunodeficiency Virus

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THE 2001 GUIDELINES FOR THE PREVENTION OF Opportunistic Infections (OIs) in Persons Infected with Human Immunodeficiency Virus are now available in draft form on the AIDS Treatment and Information Service website (<http://www.hivatis.org>). These guidelines, originally published in 1995 and revised in 1997 and 1999, address prevention of 19 HIV-associated OIs, or groups of OIs, with regard to preventing exposure to the infectious agent, preventing disease by chemoprophylaxis or vaccination (primary prophylaxis), and preventing disease recurrence in persons already treated for an OI (secondary prophylaxis). The guidelines include recommendations for adults and children, with specific in-

formation on care of pregnant women. As in earlier editions of the guidelines, recommendations are rated using a system that indicates the strength of each recommendation and quality of evidence supporting it.

The primary changes in the 2001 guidelines pertain to discontinuing chemoprophylaxis in patients whose CD4+ lymphocyte counts have increased in response to highly active antiretroviral therapy. Since the 1999 guidelines, new or strengthened recommendations are offered concerning discontinuation of primary prophylaxis against *Pneumocystis carinii* pneumonia (PCP), toxoplasmic encephalitis (TE), and disseminated *Mycobacterium avium* complex (MAC) disease; and for discontinuation of secondary prophylaxis against PCP, cytomegalovirus retinitis, disseminated MAC, TE, and cryptococcal meningitis. Other changes include new information on drug interactions and revised recommendations for vaccinating HIV-exposed/infected children.

The 2001 guidelines were developed by representatives of U.S. government agencies, professional organizations, academic institutions, and patient advocacy groups after reviewing published manuscripts, abstracts, and material presented at scientific meetings.

Comments on the guidelines may be addressed to Henry Masur, M.D., hmasur@nih.gov, and will be accepted until September 1, 2001. After this date, the document will be revised and finalized. The guidelines are expected to be updated periodically as new information becomes available.

Update on Spectinomycin Availability in the United States

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IN APRIL 2001, PHARMACIA CORPORATION (Peapack, New Jersey) announced the discontinuation of its U.S.



production of spectinomycin (Trobicin®)* and that its remaining inventory would expire on June 30, 2001.¹ Since then, examination of the inventory has revealed that, although some lots of the bacteriostatic water packaged with the spectinomycin have expired, the spectinomycin powder has a shelf-life beyond June 30. The Food and Drug Administration has approved Pharmacia's request to remove the bacteriostatic water and to relabel the current inventory of spectinomycin to expire on December 31. To obtain spectinomycin or to verify whether a spectinomycin lot may continue to be used, contact Wendy Johnson, Pharmacia Corporation, telephone (800) 976-7741, extension 30110; fax (800) 852-6421.

Pharmacia is planning to resume U.S. spectinomycin production later in 2001. When new spectinomycin is available, it will be distributed again through the usual wholesale distribution network.

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1. CDC. Shortage of spectinomycin—United States. *MMWR* 2001;50:470.

*Use of trade names is for identification only and does not imply endorsement by CDC or the U.S. Department of Health and Human Services.

†All *MMWR* references are available on the Internet at <http://www.cdc.gov/mmwr>. Use the search function to find specific articles.

Health-Related Quality of Life—Los Angeles County, California, 1999

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THE OVERALL GOALS OF THE NATIONAL health objectives for 2010 are to increase the quality and years of healthy life and eliminate health disparities in the U.S. population.¹ To assess progress in achieving these goals, the Behavioral Risk Factor Surveillance System (BRFSS) includes a core set of four health-related quality of life (HRQOL) questions that have been used since 1993 to

track adults' perceptions of their physical and mental health and level of function.² Data on HRQOL have been reported nationwide² and by state³ but typically not at the county or community level. This report summarizes findings of the 1999-2000 Los Angeles County Health Survey (LACHS) on HRQOL in the county's adult population and describes variations in HRQOL across population groups in the county. The findings have been published in a county health report and are being used by public health officials to highlight the significant disparities in HRQOL across demographic and socioeconomic populations in Los Angeles County and to guide program planning and resource allocation decisions.

LACHS is a random-digit-dialed telephone survey of the noninstitutionalized population in Los Angeles County.⁴ The adult (persons aged ≥ 18 years) component of the survey was conducted during September-December 1999. Of 15,301 adults eligible for participation, 8354 (54.6%) completed the survey. Interviews were offered in English, Spanish, Cantonese, Mandarin, Korean, and Vietnamese. All respondents were asked (1) "Would you say that in general your health is excellent, very good, good, fair, or poor?"; (2) "Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?"; (3) "Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?"; and (4) "During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?"

Responses were analyzed to estimate the percentage of adults who report poor or fair health, the mean number of days of impaired physical or mental health during the preceding 30 days* (i.e., unhealthy days), and the mean number of days when activities were limited because of poor health

during the preceding 30 days (i.e., activity limitation days). Data were weighted to reflect the age, sex, and racial/ethnic distribution of the county population using 1999 census projections. Results were stratified by sex, age, race/ethnicity, poverty level based on household income, education, and whether the respondent had ever been diagnosed with selected common chronic health conditions (i.e., heart disease, diabetes, depression, arthritis, and asthma†). To enable comparisons within and across these strata, results were age-standardized to the 2000 U.S. population aged ≥ 18 years.

Overall, 21.9% of respondents rated their health as poor or fair. The percentage of persons who reported poor or fair health was highest for those who had annual household incomes below the 1999 federal poverty level‡ (FPL) (42.3%), had less than a high school education (41.7%), were Hispanic (35.6%), and were aged ≥ 65 years (30.2%). Among persons ever diagnosed with one of the chronic health conditions, the percentage that reported poor or fair health was highest for those ever diagnosed with diabetes (50.0%).

The mean number of unhealthy days during the preceding 30 days was 6.5 for all respondents and was highest for those who had annual household incomes below the FPL (8.5), for blacks (8.3), and for those aged 50-64 years (7.6). The mean number of unhealthy days was higher for women (7.3) than for men (5.7), and was higher for those who had less than a college education (6.9) than for those who were college graduates (5.5). The mean number of unhealthy days was three times higher for those ever diagnosed with depression (16.7) than for those not diagnosed with depression (5.5). The mean number of unhealthy days was significantly higher for persons diagnosed with each of the other chronic health conditions studied than for those not diagnosed with the condition.

The mean number of activity limitation days during the preceding 30 days was 2.5 days overall, and was highest for blacks (3.5), those with annual



household incomes <200% of FPL (3.4), and those aged 50-64 years (3.1). The mean number of activity limitation days was higher for those with less than a college education (2.8) than for those who were college graduates (1.7). The mean number of activity limitation days was more than three times higher for those ever diagnosed with depression (7.5) than for those not diagnosed with depression (2.0). The mean number of activity limitation days was significantly higher for persons diagnosed with each of the other chronic health conditions studied than for those not diagnosed with the condition.

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CDC Editorial Note: Local health departments (LHDs) and their community partners require population health data at the municipal level and below to guide program planning, resource allocation, and policy development. HRQOL data are an important adjunct to more traditional measures of morbidity and mortality often used by LHDs to assess population health.⁵ This study identified important variations in HRQOL within the Los Angeles County adult population. Disparities in HRQOL were greatest across socioeconomic strata and were consistent with studies that have documented strong associations between lower socioeconomic status and poorer health outcomes, including shorter life expectancy and higher rates of many infectious and noninfectious diseases.⁶ Stratified multivariate analyses of these data are planned to examine whether other subgroup disparities occurred that were independent of socioeconomic status.

The findings also quantify the perceived burden of selected chronic health conditions on HRQOL in the county's adult population. Because locally ac-

quired HRQOL data reflect personal and community health concerns and are intuitively understandable by the general population, these data can be an important tool for mobilizing public health and community stakeholders, health-care providers, and policymakers to increase resource allocations, improve access to services, and identify more effective chronic disease prevention and treatment interventions.⁷ HRQOL measures also can be used to assess the effectiveness of these efforts, including the quality of health-care services and the impact of public health interventions.⁸ Use of the standard set of CDC HRQOL measures may enable population comparisons with public domain data (e.g., from BRFSS) and findings from prevention research based on these measures.

The findings in this report are subject to at least four limitations. First, because households without telephones or with only cellular telephones were excluded from the sampling frame, the results do not include a segment of the population that may be at increased risk for reduced HRQOL. Second, the low response rate may have introduced bias.⁹ However, the distribution of respondents by age group, sex, race/ethnicity, and geographic region corresponded with that of independent county adult population estimates. Third, the sample may underrepresent severely impaired adults because effort and functional capacity are required to participate in the survey. Finally, the variation in HRQOL by race/ethnicity may, in part, reflect language and/or cultural differences in the interpretation of the survey questions.¹⁰

Community HRQOL assessment data, when combined with demographic, mortality, morbidity, disability, behavioral risk, and related socioeconomic and environmental data, provide local health agencies with a vital planning and evaluation resource. This community health status assessment resource was envi-

sioned in the Mobilizing for Action through Planning and Partnerships (MAPP) process developed by the National Association of County and City Health Officials. The HRQOL findings from the 1999 LACHS are being used by policymakers and in community discussions about the impact of physical and mental health problems in the county. To guide program planning and to compare with similar national and state population health assessments, local health agencies periodically should assess community HRQOL with standard measures.

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*Calculated by adding the number of impaired physical health days and impaired mental health days up to a maximum of 30 days.²

†Included adults ever diagnosed with asthma and who had one or more wheezing episodes during the preceding 12 months.

‡For example, the federal poverty level for a family of two adults and two dependents in 1999 was an annual household income of \$16,895.