**Missed Opportunities for Prevention of Tuberculosis Among Persons With HIV Infection—Selected Locations, United States, 1996-1997**

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PUBLIC HEALTH CONTACT INVESTIGATIONS are conducted to find persons who have been exposed to patients with active tuberculosis (TB) and to evaluate and treat those contacts for TB infection and active TB. Persons in close (i.e., prolonged, frequent, or intense) contact with patients with active TB are at high risk for TB infection. The risk for active TB is increased greatly if the close contact is infected with human immunodeficiency virus (HIV). Isoniazid (INH) treatment for latent TB infection (LTBI) reduces the risk for developing active TB by 41% to 92%. This study examined the clinic records of TB programs to determine whether these programs used recommended practices to manage HIV-positive persons exposed to TB. The study suggests TB programs need to review their contact investigation policies, procedures, and outcomes to reduce missed opportunities for preventing active TB among HIV-positive close contacts.

Study investigators collected data during June 1998 through January 1999 site visits. Eleven US urban areas were selected by the highest number of contacts completing LTBI treatment. After case reports were linked to personal identifiers, study staff reviewed the clinic records for 6225 close contacts to 1080 patients with sputum–smear–positive TB reported to CDC during July 1996 through June 1997.

Of the 6225 close contacts, HIV status was unknown for 5415 (87%). Of the 810 close contacts with known HIV status, 109 (13%) were HIV-infected, of whom 79 (72%) received a chest radiograph; 14 (13%) had TB symptoms (e.g., cough, night sweats, and weight loss); 90 (83%) received an initial tuberculin skin test (TST); and nine (8%) did not receive a chest radiograph or an initial TST. Forty (53%) of 75 TST-negative contacts did not receive follow-up TSTs; 21 (28%) received neither a follow-up TST nor a chest radiograph. Fourteen (13%) of 109 HIV-positive contacts were identified as having active TB compared with 120 (2%) of 6116 HIV-negative contacts or contacts with unknown HIV status. The HIV-infected close contacts were less likely to be TST-positive than HIV-negative contacts or contacts with unknown HIV status (14% and 36%, respectively).

Among 95 HIV-infected contacts without active TB, 11 (92%) of 12 TST-positive contacts were placed on LTBI treatment compared with 19 (23%) of 83 TST-negative or TST-unknown contacts. A median of 50 days passed before starting an HIV-positive contact on LTBI treatment compared with 33 days for HIV-negative contacts or contacts with unknown HIV status. Tuberculosis programs employing public health nurses to conduct investigations placed 11 (92%) of 12 TST-negative or TST-unknown contacts on LTBI treatment compared with eight (11%) of 71 at programs that employ TB outreach workers.

Of the 30 HIV-positive contacts started on LTBI treatment, approximately half completed treatment. Directly observed treatment (DOT) for LTBI was given to three HIV-positive contacts; two completed treatment. During the course of LTBI treatment, 10 HIV-infected contacts had interruptions of greater than 1 month (when treatment was self-administered) or greater than 2 weeks (when placed on DOT); three of the 10 completed treatment. Of 16 HIV-positive close contacts who did not complete treatment, six (38%) refused or were unwilling to continue treatment, two (12%) were lost to follow-up, one (6%) had alcoholism, one (6%) could not tolerate medication, and six (38%) had undocumented reasons.

CDC Editorial Note: The study showed that few close contacts were assessed for HIV and that one quarter of those known to be HIV-infected were not screened completely for TB. Of eligible HIV-positive contacts, a third started and a sixth completed LTBI treatment. Because HIV positivity alters the approach to TB screening and the use of LTBI treatment, early knowledge by the healthcare provider of a close contact’s HIV status is essential. Active TB is curable and can be prevented in HIV-positive contacts when health care providers know a close contact’s HIV status and follow CDC guidelines for TB screening and treatment and facilitate adherence to TB treatment.

Health care providers should assess all close contacts for HIV infection by asking about their serostatus and offering voluntary HIV counseling and testing when the status is unknown. The TB staff should be trained to offer HIV counseling and testing to close contacts or should collaborate with HIV programs to offer these services. The use of rapid diagnostic tests may facilitate timely assessment of HIV status. All HIV-positive close contacts should be evaluated for active TB by medical history, and follow CDC guidelines for TB screening and treatment and facilitate adherence to TB treatment.
tory, symptom screening, and chest radiograph; those with an abnormal chest radiograph or symptoms should receive a sputum examination. The HIV-positive close contacts should receive an initial TST regardless of previous TST results; those with initial TST-negative reactions should receive a follow-up TST 10 to 12 weeks after last exposure to the patient with active TB. As soon as active TB is excluded, LTBI treatment should begin for all HIV-infected close contacts regardless of age, TST results, or history of previous LTBI treatment. Most HIV-positive close contacts should complete a full course of LTBI treatment. Because the HIV-positive population is less likely to react to TST and more likely to have atypical chest radiographs, health care providers need to be diligent in diagnosing TB infection and active TB. Two treatment regimens, 9 months of INH (to be taken with pyridoxine to prevent peripheral neuropathy) or 2 months of daily rifampin (or rifabutin for those taking protease inhibitors or certain nonnucleoside reverse transcriptase inhibitors) and pyrazinamide, are preferred for the treatment of HIV-positive persons with LTBI. The use of 2-month LTBI regimens for HIV-infected adults may facilitate treatment implementation and increase completion rates. However, INH is the only recommended regimen for children and pregnant women.

The findings in this study are subject to at least three limitations. First, because the study relied on existing clinic records, documentation of HIV status often was incomplete or nonexistent. Laws restricting the recording of HIV status in databases may have affected such documentation. Second, the timing of health care provider knowledge of HIV status and chest radiograph results was unknown because these dates were not collected and often were not recorded. Third, this study was designed to represent urban TB programs, not rural programs or programs not using LTBI treatment.

These findings indicate a need for better incorporation of HIV assessment into contact investigation procedures and improved coordination between local TB and HIV programs to facilitate voluntary HIV counseling, testing, and follow-up for HIV-infected close contacts. Health care providers and HIV-infected persons should be aware of optimal management of close contacts and of the benefits of prompt and well-supervised LTBI treatment to prevent active TB.

**REFERENCES**

10 available

**Recall of Isoniazid Used for Antimicrobial Susceptibility Testing for Tuberculosis**

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**Becton Dickinson Biosciences** (Sparks, Maryland) has issued a voluntary recall of a lot of isoniazid [INH] (drug lot no. 9335260) used for antimicrobial susceptibility testing (AST) of *Mycobacterium tuberculosis*. The recalled INH lot was sold as components of BACTECT® S.I.R.E. kits (lot nos. 9327296, 9342298, and 9327298) and as individual drug for reconstitution (BACTECT Isoniazid kit lot no. 9327297) during January 2000–August 25, 2000.

The recall was issued following customer complaints and subsequent investigations by the manufacturer that found that vials of streptomycin may have been labeled inadvertently as the recalled lot of INH. A second lot of INH (drug lot no. 0077261) that was implicated initially is no longer involved in the recall. In the original complaint involving lot no. 0077261, the incorrect lot number was reported to the manufacturer. This recall does not affect other sources of INH used for AST or for therapeutic purposes.

Laboratories that perform AST for *M. tuberculosis* should identify all isolates on which INH AST was performed with the recalled lot of INH. The results of tests with recalled INH are unreliable, potentially yielding falsely susceptible or falsely resistant results. These test results should be confirmed by a second test using nonrecalled INH on the same isolate or on a subsequent isolate obtained from the patient. Clinicians caring for patients with isolates requiring repeat testing should be notified of the recall and the possibility of erroneous INH AST results. If necessary, laboratories should consult with clinicians to prioritize repeat INH AST testing as follows: (1) immediately retest isolates from patients who have not responded to antituberculosis therapy as expected; (2) retest isolates for which any other first-line antituberculosis drug resistance was observed; (3) retest isolates from patients still receiving induction phase therapy; and (4) retest remaining isolates for which INH AST is unreliable.

Clinicians and patients using the standard 6-month four-drug regimen for tuberculosis should be reassured because (1) in the United States, most patients are treated successfully with this regimen; (2) most patients are infected with strains of *M. tuberculosis* that are susceptible to all first-line antituberculosis drugs; and (3) results from controlled clinical trials indicate that this regimen is effective for patients infected with INH monoresistant *M. tuberculosis*. Therefore, patients who have completed this regimen and who have been discharged as cured before repeat AST results are available do not need additional drug therapy even if INH resistance is subsequently identified. Patients found to have INH monoresistant organisms after induction therapy is complete (e.g., during continuation phase of therapy with INH and rifampin) should be evaluated for treatment failure clinically and with cultures. Patients with an acceptable clinical course and no evidence of treatment failure could complete the continuation phase with INH and ri-
has not received previously. Tuberculosis at 3, 6, and 12 months after completion of therapy and, if relapse is suspected, cultures should be obtained.

Patients who are identified as infected with INH monoresistant organisms before the induction phase of therapy is completed may be treated with a combination of rifampin, pyrazinamide, and ethambutol (or streptomycin) for 6 months. INH also may be included if repeat AST is resistant to INH at low levels (e.g., 0.1 µg/mL BACTECT media, or 0.2 µg/mL 7H10 media) but is not resistant at high levels (e.g., 0.4 µg/mL BACTECT media, or 1 µg/mL 7H10 media). Antituberculosis therapy and monitoring should be individualized for patients treated with other regimens, for patients who have not responded to therapy as expected, or for patients infected with M. tuberculosis strains resistant to one or more drugs in addition to INH. Patients with unrecognized INH monoresistance who were treated with the two-drug regimen of INH and rifampin and those treated initially with INH, rifampin, and pyrazinamide are at increased risk for treatment failure and/or relapse after treatment, possibly associated with acquired rifampin resistance. If a change in the treatment regimen is considered necessary, the initial regimen should be augmented with at least two additional drugs to which the patient’s M. tuberculosis isolate has been proven susceptible and, if possible, which the patient has not received previously.

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CDC Editorial Note: WNV primarily circulates between birds and mosquitoes and probably only incidentally infects humans, horses, and other mammals. As a result, WNV activity in birds and mosquitoes is in a specific area generally precedes WNV infection in humans and horses. In 2000, the WNV surveillance system documented epizootic WNV infections in birds and mosquitoes as sentinel events before reports of severe neurologic WNV infection in humans and prompted immediate implementation of mosquito control. This confirms the pattern suspected in 1999 when an epizootic among American crows preceded the outbreak of 62 humans identified with WNV encephalitis and meningitis in the New York City metropolitan area.

Many counties with intense WNV activity in mosquito and avian populations during the summer of 2000 have not reported WNV infections in humans or other mammals. This is probably a result of a combination of intensive mosquito control activities and variable mosquito feeding behaviors, reservoir host behaviors, human outdoor activities, and use of protective measures. However, the 12 patients with severe central nervous system disease caused by WNV probably represent a small proportion of humans infected with WNV this season. Not all persons with neurologic WNV infection may have had the condition diagnosed or reported. Most persons with WNV infection are asymptomatic or have only nonspecific symptoms for which WNV testing is not performed routinely. A serosurvey in Queens, New York City, after the 1999 outbreak indicated that less than 1% of WNV-infected persons developed severe neurologic disease.

Health-care providers in areas with documented epizootic activity should consider WNV infection in persons with suspected viral meningitis (especially among adults) or encephalitis (regardless of age). Although severe WNV central nervous system disease may be more common in the elderly, eight of the 12 persons in this report were aged <65 years. In the 1999 WNV outbreak in the New York City area, the youngest patient was aged 5 years. WNV and other arboviruses (Eastern equine encephalitis, St. Louis encephalitis, and California serogroup viruses) can cause disease in the northeastern United States through the end of October and later in more southern locations.

The recent diagnosis of a WNV-infected horse in southern New Jersey (Cape May County), a major stopover for birds migrating south, underscores the need for enhanced avian morbidity and mortality surveillance in areas south of New York City and New Jersey. If ongoing local WNV epizootic activity is detected, public health measures should be enhanced to reduce the risk for human infection.

Human Ingestion of Bacillus anthracis–Contaminated Meat—Minnesota, August 2000

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1 figure omitted

On August 25, 2000, the Minnesota Department of Health (MDH) was notified by the Minnesota Board of Animal Health (MBAH) of Bacillus anthracis isolated from a steer on a farm in Roseau County, Minnesota. The infected steer was one of five dead cattle found in a pasture on August 20. On the basis of phage typing of isolates cultured from tissues and blood samples by the North Dakota State University Veterinary Diagnostic Laboratory, B. anthracis was confirmed. This report describes the management of and public health response to human exposure to meat contaminated with anthrax.

On July 24, the farmer who owned the infected steer also had killed, gutted, and skinned a cow that was unable to rise. A local veterinarian approved the slaughter of the cow for consumption by the farmer's family. Immediately after slaughter, the farmer took the carcass (carcass X) to a custom meat-processing plant; on July 31 and August 1, carcass X was processed. Two family members ate hamburgers made from carcass X on August 15 and steaks on August 19; three other family members ate hamburgers on August 20. A sixth member prepared the meals and also may have eaten contaminated meat. All meat was reported to have been well cooked. To investigate the possibility that they had eaten contaminated meat, the family members were interviewed by MDH on August 25. Two reported gastrointestinal illness; one reported 1 day of diarrhea approximately 48 hours after eating meat from carcass X, and the second reported 3 days of abdominal pain, diarrhea, and a temperature of 102.3 °F (39.1 °C) beginning 24-36 hours after consumption. Both recovered without treatment. The family was advised by MDH not to eat any more of the meat, to contact a physician, and to begin antibiotic prophylaxis with ciprofloxacin (500 mg, orally, twice daily).

On August 29, samples of carcass X tested by the MDH Public Health Laboratory (MDH PHL) were found to contain gram-positive bacilli on microscopic examination. B. anthracis contamination was confirmed at MDH PHL and the U.S. Army Medical Research Institute for Infectious Diseases through culture on blood agar.
Before this exposure, no animal anthrax cases had been reported in northern Minnesota since recordkeeping began in 1909. However, in adjacent areas of North Dakota during 2000, 120-150 cattle have died of anthrax (L. Schuler, North Dakota state veterinarian, personal communication, 2000), and 11 farms have reported anthrax-related cattle deaths in nearby Manitoba, Canada (J.G. Spearman, Manitoba Department of Agriculture, personal communication, 2000).

Gastrointestinal anthrax in humans occurs 1-7 days after eating raw or undercooked meat from infected animals, and two forms of gastrointestinal disease have been reported. Disease affecting the distal gastrointestinal tract results in nausea, anorexia, and fever followed by abdominal pain and bloody stool. The case fatality rate among reported cases ranges from 25%-60%. Gastrointestinal anthrax has never been documented in the United States because livestock are vaccinated for anthrax in areas where the disease is endemic; animals routinely are inspected by federal and state meat inspectors before, during, and after slaughter; and raw meat is eaten infrequently. Anthrax has not been documented among the persons exposed to B. anthracis-contaminated meat described in this report; however, a serologic test to determine presence of infection is pending.

Limited experience with gastrointestinal anthrax complicates recommendations for use of postexposure prophylaxis. An extended duration of therapy is recommended for inhalational exposure because of the persistence of spores resistant to the action of antimicrobial agents. Upon cessation of chemoprophylaxis, such spores can cause disease several weeks after exposure. No evidence supports the existence of persistent spores associated with gastrointestinal forms of the disease; however, the meat consumed by the family in this report was highly contaminated with B. anthracis. Although possible interventions range from close observation to antibiotics alone to antibiotics with vaccination, because the family was at high risk for anthrax infection, management consisted of an extended course of ciprofloxacin combined with administration of anthrax vaccine.

Federal-inspected and state-inspected animal processing facilities are required to perform intensive cleaning after contact with an anthrax-infected carcasses; veterinary inspection is not provided at custom meat processors. Slaughterhouse workers who may be exposed to an anthrax-contaminated carcass should receive medical evaluation for symptoms and for possible treatment. Management of anthrax in livestock should include (1) quarantine of the herd; (2) removal of the herd from the contaminated pasture, if possible; (3) vaccination of healthy livestock; (4) treatment of symptomatic livestock; and (5) disposal of infected carcasses, preferably by burning. Bedding and other material found around the carcass (e.g., soil) should be incinerated with the carcass and buried.

Veterinarians notified of sudden death in an animal or of an animal unable to rise should consider anthrax as a diagnosis, especially in areas where anthrax is endemic. However the potential risk for animal anthrax exists in all areas of the United States. Vaccination of livestock in areas where anthrax is endemic is the most effective method of prevention in animals and humans. Cases of anthrax in animals and cases of suspected human exposure should be reported immediately to the state health department, federal animal health officials, and to CDC's National Center for Infectious Diseases, Meningitis and Special Pathogens Branch, telephone (404) 639-3158.
Outbreak of Acute Febrile Illness Among Participants in EcoChallenge Sabah 2000—Malaysia, 2000

On September 7, 2000, CDC was notified by Idaho Department of Health about a case of acute febrile illness in a 35-year-old man; the illness was characterized by acute onset of high fever, chills, headache, and myalgias. The patient had participated in the EcoChallenge Sabah 2000 Expedition Race, a multisport event held during August 20-September 3, at various sites in Sabah in Malaysian Borneo.

This report presents preliminary findings of an ongoing investigation to identify cases of acute febrile illness among athletes who participated in the EcoChallenge Race in Borneo during August 2000. Preliminary laboratory test results indicate the probable cause of illness to be leptospirosis, a spirochete infection. The event involved jungle trekking, open water swimming, river and ocean paddling, mountain biking, canyoneering, scuba diving, and spelunking. Participating were 76 four-person teams from 26 countries, including 37 teams from the United States. Subsequently, nine other EcoChallenge participants who became ill were identified in California (five in San Diego County, two in Orange County, and two in Los Angeles).

To identify additional athletes with febrile illness, an EcoChallenge participant list was obtained from race organizers, and a telephone survey was administered by CDC with the assistance of several state public health departments. As of September 13, 82 (33%) of 155 U.S.-based athletes have been contacted; 37 (45%) reported having fever and 12 (15%) were hospitalized. No deaths have been reported.

On September 12, serum specimens obtained from two hospitalized athletes from Los Angeles were tested at CDC for leptospirosis using the Dip-S-Ticks® assay (Leptospira INDX Dip-S-Ticks; Integrated Diagnostics, Baltimore, Maryland) and the Pan-Bio® enzyme-linked immunosorbent assay (ELISA) IgM test (PanBio, Brisbane, Australia). One athlete tested positive with both tests on an acute-phase serum specimen obtained 4 days following onset of fever. The second athlete tested negative with both tests on the acute-phase specimen but positive with both tests on a follow-up specimen obtained 4 and 6 days following onset of fever.

On the basis of laboratory test results and the clinical features of illness, CDC advises the following to clinicians caring for EcoChallenge participants. First, asymptomatic athletes that were taking chemoprophylaxis for leptospirosis (i.e., 200 mg oral doxycycline weekly) should ensure that their final weekly dose was taken following completion of the race. Second, although the merits of one dose of post-exposure chemoprophylaxis with 200 mg oral doxycycline are unknown, asymptomatic athletes who participated in the race and who were not taking chemoprophylaxis for leptospirosis may wish to discuss the single-dose option with their physician. Third, for athletes with mild symptoms consistent with leptospirosis, treatment should include 7 days of oral doxycycline, 100 mg twice daily. Finally, for hospitalized patients with severe illness (e.g., persistent high-grade fever, impaired hepatic or renal function, or severe neurologic disturbances, including coma, hemiplegia, or transverse myelitis), treatment should include 7 days of intravenous penicillin G, 1.5 million units every 6 hours. As with other spirochete infections, a Jarisch-Herxheimer reaction can develop following the initiation of penicillin therapy for leptospirosis. Although these reactions serve as an indicator of therapeutic efficacy, they can be associated with increased morbidity and mortality; patients receiving intravenous penicillin should be monitored for shocklike symptoms.

On September 13, CDC issued an advisory (http://webdev.cdc.gov/travel/other/lepto-malaysia.htm) about the probable leptospirosis outbreak associated with the EcoChallenge event to raise awareness among health-care workers and participants of the event in Borneo. The Meningitis and Special Pathogens Branch (MSPB) at CDC is interested in receiving reports through state and local health departments of additional participants who have been ill or have had fever since August 21. In addition, MSPB will test clinical specimens for leptospirosis received through state and local health departments.

Reported by: California Dept of Health. Idaho Dept of Health. Council of State and Territorial Epidemiologists, Atlanta, Georgia. Meningitis and Special Pathogens Br, Div of Bacterial and Mycotic Diseases, National Center for Infectious Diseases; and EIS officers, CDC.