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Prevention and Control of Tuberculosis Among Homeless Persons Recommendations of the Advisory Council for the Elimination of Tuberculosis

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Summary

Because tuberculosis (TB) is a major problem among homeless persons, the Advisory Council for the Elimination of Tuberculosis has developed recommendations to assist health-care providers, health departments, shelter operators and workers, social service agencies, and homeless persons prevent and control TB in this population. TB should be suspected in any homeless person with a fever and a productive cough of more than 1-3 weeks' duration, and appropriate diagnostic studies should be undertaken. Confirmed or suspected TB in a homeless person should be immediately reported to the health department so that a treatment plan can be decided upon and potentially exposed persons located and examined. Patients with TB should be counseled and voluntarily tested for human immunodeficiency virus (HIV) infection because TB treatment recommendations are different for HIV-seropositive and HIV-seronegative persons (1). TB therapy should be directly observed whenever possible. This may require the establishment of special shelters or other long-term-care arrangements for homeless persons with TB. For each person with an infectious case, an investigation should be conducted to identify exposed persons, and those found to be infected should be considered for preventive therapy. Shelter staff should receive a tuberculin skin test when they start work and every 6-12 months thereafter. Those with positive skin test results should be considered for preventive therapy according to current guidelines. Shelters for the homeless should be adequately ventilated. The installation of ultraviolet lamps also may be useful to further reduce the risk of TB transmission.

INTRODUCTION

Since the early 1900s (2), tuberculosis (TB) has been recognized as an important health problem among homeless persons and among residents of inexpensive lodging houses, night shelters, single-room occupancy hotels, and common hostels. Subsequent reports have continued to call attention to this problem, especially in the United

Kingdom (3-11). With the increase in homelessness in the United States during the 1980s, TB among homeless persons became a subject of heightened interest and concern (12-24).

There is no universally agreed-upon definition of homelessness; in general, however, the homeless can be defined as persons who do not have customary and regular access to a conventional dwelling or residence (25). The exact number of homeless persons at any given time is not known, and reported estimates have varied widely. According to the Urban Institute, there may have been more than 1 million persons in the United States who were homeless at some time during 1987 (26).

From a national perspective, the overall incidence of active TB and the prevalence of latent tuberculous infection among the homeless are unknown. Based on screening at selected clinics and shelters, the prevalence of clinically active disease ranges from 1.6% to 6.8% and the prevalence of latent TB infection ranges from 18% to 51% (12,13,15-17). Clinical data from the National Health Care for the Homeless project indicated a point prevalence of active TB of 968/100,000 homeless adults (27). However, because of the selective nature of these screening activities, it is not appropriate to extrapolate these reported prevalence rates nationwide or to ``special populations,'' such as single-parent families or runaway children (28).

Although shelters and other inexpensive housing for the homeless are vital to the survival of these persons, there is substantial potential for TB transmission in such facilities (18), especially in the winter when shelters are likely to be more crowded and ventilation from the outside may be diminished.

The recommendations in this document are intended for the entire medical community and the public, but are particularly targeted to health department TB-control programs and to those who provide health care and other services to homeless persons. Health departments and shelter operators are encouraged to implement these recommendations whenever applicable.

ASSESSMENT OF THE MAGNITUDE OF THE PROBLEM

Communities should assess the nature and magnitude of the TB problem in their area, specifically, the incidence and prevalence of TB among persons who are homeless. All patients with TB should be specifically asked whether they are homeless or live at a single-room occupancy hotel, shelter, or lodging house since they may not volunteer such information. Health departments should maintain, and regularly update, listings of single-room occupancy hotels and homeless shelters so that patients' addresses can be checked against these listings. Shelters should be encouraged to maintain lists of names of persons staying there. This will facilitate health department searches for patients in need of diagnostic or therapeutic services.

PRIORITIES FOR TB SERVICES

Priorities for TB prevention and control activities among homeless persons have been established on the basis of their clinical and public health importance and their cost-effectiveness (see box).

Priorities for Tuberculosis Prevention and Control Activities Among Homeless Persons

1. The highest priority should be given to a) detection,

evaluation, and reporting of homeless persons who have current symptoms of active TB and b) completion of an appropriate course of treatment by those diagnosed with active TB.

2. The second priority should be screening and preventive therapy for homeless persons who have, or are suspected of having, human immunodeficiency virus (HIV) infection.

3. The third priority should be the examination and appropriate treatment of persons with recent TB that has been inadequately treated.

4. The fourth priority should be screening and appropriate treatment of persons exposed to an infectious (sputum-

positive) case of TB. Because contacts are difficult to define in a shelter population, it is usually necessary to screen all residents of a shelter when an infectious case is identified.

5. The fifth priority should be screening and preventive therapy for homeless persons with known medical conditions that increase the risk of TB, e.g., diabetes mellitus (29).

CASE FINDING

Educational materials on TB should be developed for shelter clients, shelter employees, and volunteers. This material should address the mode of spread, the common signs and symptoms, and methods for treatment and prevention. Information on local resources for TB care should be made available to shelter staff and guests.

TB case finding should be part of the regular health care provided to homeless persons. Shelter staff and others providing services can assist in case finding by identifying persons with a persistent cough and ensuring that suspected cases are quickly evaluated by a health-care provider. If this evaluation cannot be done at the shelter, immediate transportation to a health-care facility should be provided.

If the clinical evaluation of a symptomatic person is consistent with TB, appropriate diagnostic tests (e.g., sputum smears and cultures and chest radiographs) should be done as quickly as possible. A homeless patient will usually need to be hospitalized at least until the diagnostic evaluation is complete and effective therapy instituted.

Routine tuberculin skin test screening of asymptomatic homeless persons for TB is not an efficient way to find new cases. Chest radiographic screening of homeless persons may be useful during outbreak investigations.

CASE REPORTING

The diagnosis of TB in a homeless patient may occur during diagnosis and treatment of an unrelated problem or during incarceration in a jail or prison. When a homeless person is suspected of or diagnosed as having TB, the health department should be notified promptly so that appropriate follow-up can be arranged. Delay or failure to notify the health department of a case of confirmed or suspected TB may result in the patient's being lost to follow-up, a failure to initiate appropriate treatment, and continuing transmission of tuberculosis in the community.

CASE MANAGEMENT

Homeless patients with newly diagnosed infectious TB should be appropriately housed to allow initial therapy to be fully supervised and to preclude continuing transmission of TB in the community. Ideally, homeless persons with active TB should be housed in a special shelter, halfway house, or other long-term treatment facility until therapy is complete or more permanent housing is identified. It is also important that ancillary services, such as substance abuse treatment and evaluation and treatment of HIV disease, be offered in these facilities.

A health department staff member should visit a homeless person with suspected or confirmed TB, in the hospital or elsewhere, as soon as possible after the diagnosis is suspected or made. The health department worker should make an assessment of the likelihood of adherence to therapy, if treatment is to be given on an outpatient basis. During the initial visit, the treatment plan should be discussed and the patient's cooperation elicited.

Arrangements for the patient's first visit to the clinic or other place of intended outpatient care should be made before the patient is discharged from the hospital. Details about personal activities, friends, and favorite gathering places, which may assist in locating the patient in the field, should be included in the chart. A physical description of the patient should also be included in the chart to assist field workers in locating the person. It is essential that rapport between the patient and the health department staff be established and maintained.

The homeless person with TB may not view TB as the highest priority concern. Other concerns -- e.g., shelter, food, and safety -- are likely to be of greater priority. Thus, the involvement of social workers on the treatment team to assist in solving these other problems is important for achieving successful treatment of TB.

Treatment must be carefully monitored. Failure of patients to take TB medications as prescribed can result in relapses, drug resistance, further transmission of TB, and death. For most patients, it is desirable that a health-care worker or other responsible adult directly observe ingestion of medication. This allows careful monitoring for adherence to therapy and drug side effects. In addition, carrying medications may be dangerous for homeless persons; if others believe the medications are addictive or valuable, the homeless person may be robbed or assaulted.

Whenever possible, TB clinics should be located close to shelters or other places (e.g., soup kitchens) where homeless persons receive services. If this is not possible, transportation to the clinics should be provided. The clinic schedule should include hours that facilitate patient attendance. Incentives and enablers to encourage adherence should be used (20-22,30). These might include items such as food or food vouchers, cash, special lodging, transportation vouchers or tokens, articles of clothing, priority in food lines, and assistance in filing for benefits. In many communities, successful programs represent a cooperative community activity in which local merchants or American Lung Association affiliates provide the incentives.

Treatment outcomes are likely to be optimal if homeless patients have a reliable source of food and shelter throughout the course of therapy. Some communities have successfully used halfway houses and special shelters for this purpose. In areas lacking these alternatives, a longer period of hospitalization in an acute-care facility may be necessary. Long-term institutionalization may be essential for the management of mentally ill or seriously uncooperative patients. If, despite the efforts of health-care providers, any infectious patient (regardless of residential status) refuses treatment, temporary enforced isolation should be instituted in accordance with state and local public health laws and regulations. This option should be used when necessary after due legal process. Medicaid reimbursement for these services should be available in all states.

TREATMENT

A responsible person (e.g., physician, nurse, outreach worker) should observe the patient ingest medications to prevent treatment failure, the emergence of drug-resistant organisms, and continued transmission of infection (31). Provided there is adequate medical supervision, treatment can be given and observed by designated persons at the shelter or other location. All TB treatments of homeless persons should be free of charge to the patient.

Treatment should stress the use of intensive multidrug, bactericidal regimens for all eligible patients (29). Outpatient treatment should be a regimen that includes isoniazid and rifampin in addition to pyrazinamide and ethambutol for the first 2 months of therapy. Drug susceptibility tests should be initially obtained on positive cultures from all patients. If the organisms are susceptible to both isoniazid and rifampin, ethambutol can be discontinued and the second phase of therapy completed with an additional 4 months (if patient is HIV negative) or 7 months (if patient is HIV positive) of treatment with isoniazid and rifampin. Treatment can be given daily for the first 2 weeks to 2 months and either daily or twice weekly thereafter, or it can be given three times weekly from the beginning (32). Baseline laboratory tests should be done to detect conditions contraindicating certain drugs and to better assess any subsequent adverse drug reactions (29).

For patients with active pulmonary TB, sputum smears and cultures should be obtained at 2- to 4-week intervals until cultures become negative. Patients should be monitored for possible adverse drug effects by asking them about signs and symptoms. Appropriate laboratory studies should be obtained when indicated. Hospitalized patients who are initially found to have positive sputum smears or cultures can return to the shelter when there is bacteriologic and clinical evidence of a response to therapy, i.e., three consecutive daily negative sputum smears and asymptomatic status.

PREVENTION

Early case finding and effective treatment of persons with active TB are the most important measures for preventing spread of TB in the community. A thorough contact investigation should be done around every case (33). Although such investigations are difficult in shelters because of the transient nature of the population, they should always be attempted.

Contact investigations are usually based upon screening with the tuberculin skin test, followed by chest radiographs for those with skin test reactions greater than or equal to 5 mm. Because of the high prevalence of TB among some homeless populations and because of the possibility of false-negative tuberculin skin test reactions due to disease or other factors, it may be useful to screen homeless populations with chest radiographs during an outbreak investigation.

Several factors in the shelter environment influence the likelihood of TB transmission. The absolute number and population density of persons sharing the same breathing space is an important transmission factor in shelters. If all other factors are constant, the size of the shelter population is directly proportional to the likelihood that someone with infectious TB will be present and that someone else will become infected (34). Conversely, the smaller and less crowded the shelter, the lower the risk.

The probability of transmission is affected by building ventilation. Ventilation should be at or above 25 cubic feet of outside air per minute per person. Recirculated air may contribute to transmission within a shelter. During periods of peak occupancy, it may be difficult to provide ventilation at adequate levels. Air quality consultants can determine the adequacy of ventilation and recommend improvements where necessary.

Because even optimal ventilation does not preclude TB transmission, supplemental upper room germicidal ultraviolet (UV) air disinfection may be useful to further reduce the chance of transmission (35). UV lamps may be useful when ongoing transmission of infection is demonstrated by the continuing occurrence of cases or skin test conversions. For safety and efficacy reasons, UV fixtures should be planned, installed, and monitored after installation by an experienced consultant. To avoid acute eye and skin injury, shelter staff and workers should be advised not to look at the tubes in UV fixtures, and exposure at eye level must be no greater than 0.2 microwatts per square centimeter over 8 hours. Nonreflective paint should be used in rooms where UV lamps are located.

Tuberculin skin test screening and isoniazid preventive therapy programs among homeless persons have been generally unproductive because of poor patient adherence to follow-up visits and treatment regimens (36). Screening should be undertaken only if there is a reasonable possibility that most infected persons identified will complete preventive treatment. Priorities for preventive therapy among TB-infected persons have been established (see box) (29).

Priorities for Preventive Therapy Among TB-infected Persons

1. Persons with HIV infection
2. Recent contacts of persons with infectious TB
3. Persons with recent skin test conversions
4. Persons with recent TB disease who have been inadequately

treated

5. Persons with negative sputum cultures and stable fibrotic lesions on chest radiographs consistent with inactive TB

6. Persons with medical conditions that increase the risk of TB (29)

Incentives may also be used to improve adherence to preventive treatment. Twice-weekly directly observed isoniazid preventive therapy, given in a dose of 15 mg/kg, should be considered if the person cannot or will not comply with daily self-administered therapy. Although the efficacy of this regimen has not been proven in preventive therapy trials, extrapolation from clinical therapy trials suggests it would be effective (37).

Staff and regular volunteers in shelters for the homeless should receive a Mantoux tuberculin skin test when they start work and every 6 to 12 months thereafter. The two-step method of testing is generally recommended (38).

Persons with positive reactions should be evaluated and considered for preventive therapy according to current American Thoracic Society / CDC guidelines (29). The results of staff and volunteer skin tests should be maintained in a central confidential file.

Clinical data on homeless clients (guests) should be maintained and shared between shelters.

HIV INFECTION AND TB

HIV infection is a major risk factor for the development of TB (39). An association between TB, HIV infection, and homelessness has been documented (21,22,24).

Persons with TB and HIV infection appear to respond to standard anti-TB drugs (40-42), but data on clinical and bacteriologic response among these patients are limited. When HIV infection is known or suspected, the recommended initial treatment regimen is the same as for non-HIV-infected persons. Patients treated with rifampin who are on methadone should have the methadone dosage increased to avoid withdrawal symptoms resulting from the interaction between the two drugs (43).

If the patient has drug-susceptible organisms, the continuation phase need include only isoniazid and rifampin. If resistance to any of the drugs in the regimen is found, the treatment regimen should be appropriately revised in consultation with a specialist. Treatment should be continued for a minimum of 9 months and for at least 6 months beyond documented culture conversion as evidenced by three negative cultures. If either isoniazid or rifampin is not or cannot be included in the regimen, therapy should continue at least 18 months and for at least 12 months after culture conversion.

All patients diagnosed with TB should be offered counseling and HIV-antibody testing. Previously published guidelines for counseling and testing and notification of sex partners and those who share needles with HIV-infected persons should be followed (44). Particular emphasis should be placed on offering counseling and HIV-antibody testing to persons with extrapulmonary TB and persons with TB in the age groups in which most HIV infections occur (i.e., those ages 25-44 years). Because homelessness may be a sequela of injecting drug use or HIV disease, information on behaviors * associated with an increased risk or prevalence of HIV infection should be routinely sought from homeless persons. If HIV infection is considered a possibility, counseling and HIV-antibody testing should be strongly encouraged. Because HIV infection is one of the strongest known risk factors for the progression of latent tuberculous infection to TB (39), the presence of HIV infection in a person with a positive tuberculin skin test (i.e., greater than or equal to 5 mm induration) is an indication for preventive therapy regardless of that person's age. The recommended therapy is isoniazid, 300 mg daily or 15 mg/kg twice weekly for 12 months. Preventive therapy should be started only after excluding active pulmonary or extrapulmonary TB.

HIV-infected persons, with or without acquired immunodeficiency syndrome (AIDS) or other HIV-related disease, should be given a Mantoux skin test consisting of 5 tuberculin units of purified protein derivative. Although false-negative results may result in these persons because of HIV-induced immunosuppression, positive tuberculin reactions are clinically meaningful. Persons with clinical AIDS or other HIV-related disease should receive a chest radiograph and be examined for evidence of extrapulmonary TB, regardless of the skin test reaction. If abnormalities are noted, additional diagnostic studies for TB should be undertaken.

ROLE OF THE HEALTH DEPARTMENT

Health departments must ensure the provision of essential TB supplies and services for homeless persons regardless of their ability to pay. Care should be readily accessible to homeless persons; this often means provision of services at a shelter. Whenever possible, outreach services should be provided by trained outreach workers with the same cultural, ethnic, and linguistic background as the homeless population being served.

Health departments should also ensure that expert TB medical consultation is available to the clinicians and nurses who provide health-care services to homeless persons.

State and local health departments should provide TB training to those who provide health-care services to homeless persons. (CDC has made training materials available to state health departments to assist in this training.)

There is a national network of primary health-care programs for the homeless as a result of the McKinney Homeless Assistance Act. The 109 community programs supported by the Bureau of Health Care Delivery and Assistance of the Health Resources and Services Administration are appropriate partners for local health agencies in controlling TB among the homeless.

ROLE OF THE U.S. PUBLIC HEALTH SERVICE

The U.S. Public Health Service (PHS) should promote collaboration between health departments and those who provide health care to the homeless so that they can plan and implement TB prevention and control activities. The PHS should require documentation of such collaboration as part of applications from states and cities for federally funded grants and cooperative agreements. In addition, as part of routine site visits, PHS staff should review state and local TB activities and make recommendations for more effective collaborative programs.

CONCLUSIONS

Homeless persons suffer disproportionately from a variety of health problems, including TB. Detecting, treating, and preventing TB in this special population benefit not only persons who are homeless, but society at large. The goal of prevention and control of TB among the homeless is difficult and challenging, but it can be achieved.

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- The Advisory Council for the Elimination of Tuberculosis recognizes that a variety of terms are used and preferred by different groups to describe race and ethnicity. Racial and ethnic terms used throughout the document reflect the way data are collected and reported by official health agencies.

- Based on seroprevalence studies, behaviors that place a person at risk for HIV infection include injecting drug use and male homosexual contact. Other factors that increase the risk for HIV infection among adults include having received blood or clotting factor concentrate between 1978 and 1985 and having had sexual relations at any time since 1978 with a) a person known to be infected with HIV or to have AIDS, b) a man who has had sexual contact with another man, c) prostitutes, d) injecting drug users, or e) persons born in

countries where most transmission of HIV is thought to occur through heterosexual sexual contact. Risk factors for HIV infection among infants and children include a) parents, especially the mother, with HIV infection or any of the adult risk factors, and b) receipt of blood or clotting factor concentrates between 1978 and 1985.