

**TUBERCULIN SKIN TESTING OF INPATIENTS
IN CONNECTICUT HOSPITALS**

*Recommendations of the
Connecticut Tuberculosis Elimination
Advisory Committee*

June, 1995

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FORWARD

In October 1992, the Commissioner of the Department of Public Health and Addiction Services established the Connecticut Tuberculosis Elimination Advisory Committee (TEAC)*. At her request, the TEAC set out to make recommendations regarding tuberculin screening of admissions to Connecticut hospitals.

The purpose of the following recommendations is to set forth a consensus policy toward the prevention of tuberculosis among persons who may be latently infected and who are admitted to Connecticut hospitals, with particular reference to acute care hospitals. They are intended to complement the national Centers for Disease Control and Prevention's *Guidelines for Preventing the Transmission of Tuberculosis in Health-Care Facilities, Second Edition (1)*. The latter provide specific guidance for prevention of transmission from persons with active, infectious tuberculosis in the health-care facility setting and for employee tuberculin skin testing.

These recommendations are particularly directed to relevant medical and administrative personnel in all hospitals in Connecticut, especially those which serve populations from the high AIDS and/or TB incidence areas of CT¹. Personnel include: hospital administrators; hospital epidemiologists; infection control personnel; directors of medicine, pulmonary disease, infectious disease, surgery, pediatrics, family medicine, psychiatry, obstetrics and gynecology; and the respective chief residents.

* *The Advisory Committee membership who participated in the development and review of this document are as follows: Acting Commissioner Yvette Melendez Thiesfield, Dr. John Brackett, Dr. Richard Castriotta, Chairman, Dr. Brian Cooper, Dr. Lloyd Friedman, Ms. Rita Grygus, Dr. Walter Hierholzer, Ms. Catherine Ligi, Dr. Richard Melchreit, Ms. Debra Rosen, Dr. Peter Selwyn, Ms. Carolyn Suchecki, Dr. Ulder Tillman, Dr. Stephen Updegrave; Staff: Dr. James Hadler, Ms. Ann Levison, Mr. Joseph Marino.*

¹ *Annual tuberculosis incidence ≥ 10 per 100,000 population and/or annual number of new AIDS cases is ≥ 10 and AIDS case rate is ≥ 20 cases per 100,000. In Connecticut as of 1993 these towns include: Bridgeport, Danbury, Hartford, New Britain, New Haven, New London, Norwalk, Stamford, Waterbury and West Haven.*

INTRODUCTION

Background

The epidemiology of TB has been changing in Connecticut. In particular, relative increases have been noted since the mid-1980s in urban areas, among minority groups, among the foreign-born, and among young & middle-aged adults (2). Twenty percent of all cases have underlying HIV infection. It has been nationally recommended that to improve TB control, TB prevention efforts need to be targeted at these demographic groups and persons with medical risk factors for developing TB (3,4).

Hospitals in urban areas are potentially important sites for tuberculin screening and initiation of preventive therapy for a number of reasons. (a) A relatively high percentage of the patient population is HIV infected. (b) Many in the inpatient population are in medical or demographic high-risk groups for whom screening efforts are recommended and preventive therapy is indicated. In a recent point prevalence study of persons hospitalized in medical and surgical units in two Connecticut hospitals, more than 50% of patients were found to be in such high-risk groups (5). (c) Screening can be completed and preventive therapy started during a single admission, much more easily and efficiently than on an outpatient basis. (d) The potential exists for follow-up of persons started on preventive therapy through their primary care providers. (e) Screening for tuberculous infection will hasten recognition of infectious TB cases admitted to the hospital and decrease the likelihood of nosocomial TB transmission to patients and personnel. (f) Efforts which decrease community incidence of TB will decrease the future potential for infectious cases to occur, be admitted to the hospital and pose a risk of nosocomial transmission to other patients and personnel. These recommendations should be especially effective in preventing TB in persons with frequent admissions to the hospital. (g) Hospitals in urban areas are largely staffed by physicians-in-training. Integration of TB prevention into basic patient care is an essential clinical training experience for them, as well as a means of reducing their current and future risk of exposure to TB. (h) Hospitals are places where outbreaks of tuberculosis have occurred. Baseline and serial tuberculin testing of patients can contribute to detection and evaluation of outbreaks.

A recent Connecticut study showed that little systematic tuberculin screening is currently occurring in CT hospitals although a high percentage of inpatients are candidates for preventive therapy if found to be tuberculin positive (5). In this study, medical charts were reviewed for admissions to the medical and to the surgical units in two large urban hospitals with high TB and AIDS admission rates. Of 221 admissions who were reviewed, 128 (58%) would have been candidates for preventive therapy if found to be tuberculin positive. However, only 9.4% of these 128 admissions were actually skin tested. While the testing rate was higher among admissions to the medical services than the surgical ones (13% vs 0%), it was no higher for persons with HIV infection than for those whose status was negative or unknown.

Definitions

Tuberculosis - the state of disease caused by *Mycobacterium tuberculosis*. Persons with tuberculosis have actively multiplying TB bacilli, symptoms, and, if the lungs are involved and effective therapy has not been started or is not being taken, have the potential to infect others. For purposes of these recommendations, "active" tuberculosis and "case" of tuberculosis are synonyms for tuberculosis.

Tuberculous infection - the state of being infected with *M. tuberculosis*. Tuberculous infection is usually manifest by a positive tuberculin skin test. A person with tuberculous infection can either have tuberculosis or latent tuberculous infection.

Latent tuberculous infection - the state of infection with *M. tuberculosis* in which TB bacilli are dormant, the infected person has no symptoms and infection is not contagious. A person with latent infection, however, is at lifetime risk of developing active tuberculosis from their latent infection unless appropriate preventive therapy is taken.

HIV infection - the state of being infected with *human immunodeficiency virus type 1*. This is usually manifest by a positive HIV antibody test and or a diagnosis of AIDS.

TB/HIV coinfection - the state of having simultaneous infection with both *M. tuberculosis* and HIV. A person with coinfection can have either tuberculosis or latent tuberculous infection. Those with latent tuberculous infection have a 7-10% risk per year of developing active tuberculosis.

State Reporting Requirements

The following statutory requirements apply to reporting tuberculosis and tuberculous infection in Connecticut²:

1. Tuberculosis is both physician and laboratory reportable within 12 and 48 hours of diagnosis respectively to the State Department of Public Health and Addiction Services and to the local health department of the town of the patient's residence. Suspect cases are similarly reportable. Suspect cases include anyone on whom anti-tuberculosis therapy is empirically started pending confirmatory diagnosis and anyone on whom a positive smear for acid fast bacilli (AFB) is obtained.
2. TB/HIV coinfection is physician reportable within 48 hours of diagnosis. This includes HIV infection in cases of tuberculosis and persons with both latent tuberculous infection and HIV infection.

² *Connecticut General Statutes Sections 19a-5 and 19a-215, Public Health Code Section 19a-36. Penalty for not reporting a given case is up to \$500.*

RECOMMENDATIONS

Based on these considerations, the CT TB Elimination Advisory Committee recommends the following to improve hospital-based TB control and to involve hospitals in community TB control.

TUBERCULIN SCREENING OF ADMISSIONS

- Hospitals should adopt policies and procedures to ensure that all admissions with an anticipated length of stay of three or more days:
1. have a record of at least one tuberculin skin test recorded in a standard location in their chart,
 2. be re-tuberculin skin tested on admission at least every 2 years if previously tuberculin-negative and in a risk group for TB for which preventive therapy is potentially indicated.

Risk groups for whom preventive therapy is potentially indicated if a person is found to be tuberculin positive include (3,4):

- a) all persons <35 years of age;
- b) all ≥ 35 years old who have any of the following attributes:
 - * HIV infection
 - * injection drug use
 - * chest x-ray findings which show upper lobe fibrotic lesions
 - * recent contact with persons known to have or who are suspected of having clinically active TB
 - * immunosuppressive therapy, including prolonged high dose corticosteroids
 - * malignancy
 - * end-stage renal disease
 - * diabetes mellitus, poorly controlled
 - * clinical situations associated with rapid weight loss
 - * silicosis
 - * post gastrectomy

For simplicity of practice and because many persons with underlying HIV infection may not have already been identified, hospitals located in high TB and AIDS incidence areas should consider universal screening of all admissions instead of selective screening of those ≥ 35 years of age.

SCREENING METHODS AND INTERPRETATION

Tuberculin Testing

- All testing should be done using the Mantoux intradermal test technique using PPD* (purified protein derivative). Multiple puncture test techniques are not acceptable in this setting. Results should be recorded in millimeters of induration³.

³ *A video and a wall chart which review skin testing technique and interpretation are available from the American Lung Association of Connecticut (1-800-332-LUNG).*

- . Medical charts should be organized in a standard manner so that information on results of tuberculin skin tests can be readily located by any hospital staff member.

Interpretation

- . An induration of ≥ 5 mm should be considered indicative of TB infection (positive skin test) in any person who:
 - a. is known to be HIV positive,
 - b. is a recent close contact to an infectious case of tuberculosis,
 - c. has a chest x-ray which shows upper lobe fibrotic lesions.
- . All persons who have a tuberculin induration of 5-9 mm should be evaluated for each of the above factors. For persons without any of them, an induration of ≥ 10 mm indicates TB infection. A negative test does not necessarily rule out either latent or active tuberculosis.

BCG Vaccination

- . ***A past history of BCG vaccination is not a contraindication to testing, nor should it be considered in the interpretation of test results.*** A positive skin test as defined above is more likely to represent true infection with M. tuberculosis than a false positive reaction.

Anergy Testing

- . ***All persons with known or suspected HIV infection should be tested for anergy at the time they are tuberculin skin tested.*** Anergy testing in conjunction with tuberculin testing may be useful in other situations, e.g., in persons who are admitted with an acute febrile illness, in persons on immunosuppressive therapy, and in persons with recent rapid weight loss.
- . The results of the anergy tests should be recorded with the tuberculin results. In the presence of anergy a negative tuberculin skin test is not readily interpretable and these persons should be evaluated for active TB disease.
- . Anergy testing should be done using the Mantoux intradermal technique using at least two skin test antigens other than tuberculin. These antigens should include mumps, and either *Candida* or tetanus toxoid (6). Any amount of induration to these antigens should be considered evidence of delayed type hypersensitivity responsiveness. ***Inability to obtain antigens for anergy testing is not a contraindication to proceeding with tuberculin testing.*** The goal of screening is to detect persons who may benefit from preventive therapy for tuberculosis. It is better to identify some persons who are candidates for preventive therapy than to identify none.
- . Because of their extraordinary risk for developing active tuberculosis, persons with HIV infection and documented anergy should be considered for preventive therapy after individual clinical and epidemiological assessment of the likelihood of TB infection. Anergic HIV-infected persons should be offered INH prophylaxis if the underlying probability of latent infection is $\geq 10\%$. To date there are two groups in which this has been documented in Connecticut: close contacts to active TB cases and state prison inmates.

MANAGEMENT OF PERSONS WITH TUBERCULOUS INFECTION

- . ***All persons with a positive tuberculin skin test who have not already completed a course of anti-tuberculosis or preventive therapy should be evaluated for preventive therapy.*** Before being offered preventive therapy, each person should be evaluated for active tuberculosis and for medical contraindications to preventive therapy. Evaluation should minimally include a clinical review of systems for symptoms of active TB and acute or active liver disease, questioning for previous reactions to isoniazid, a chest radiograph, a urinalysis, and in adults, baseline liver function tests (7-ATS recommendations).

The usual preventive therapy regimen is isoniazid (INH). The recommended duration of INH preventive treatment is 6 to 12 months of continuous therapy. Twelve months is recommended for persons with HIV infection and other forms of immunosuppression and for adults with abnormal chest films that show fibrotic lesions likely representing old healed tuberculosis and adults with silicosis. Other infected persons should receive a minimum of 6 continuous months and 12 months, if possible. In addition to a daily dose regimen, INH can be given twice weekly at a dose of 15 mg/kg. An alternative to the 12 month regimen for adults with fibrotic lesions or silicosis is a 4-month regimen of INH and rifampin (7).

- . Persons with TB-HIV coinfection have an extraordinary risk of developing tuberculosis. They should be reported immediately to the state TB Program and local health department as required by state law⁴. ***Consultation with the state TB Program and the local health department as to whether each person with TB-HIV coinfection should be started on DOPT (directly observed preventive therapy) rather than self-administered therapy should be a routine part of discharge planning.*** The state TB Program has resources to provide outreach and DOPT to all persons with TB-HIV coinfection. In addition, it may be necessary to consider the patient's other needs for preventive therapy to be successful, e.g., substance abuse treatment services, assistance with housing or transportation.

⁴ Connecticut General Statutes Sections 19a-5 and 19a-215, Public Health Code Section 19a-36. Penalty for not reporting a given case is up to \$500.

- . ***Active efforts to ensure continuity of treatment are essential to the completion of preventive therapy in persons started on self-administered therapy.*** Before discharge of persons started on self-administered preventive therapy, their regular primary medical care provider should be notified. For those for whom there is no regular care provider, referral should be made to the nearest public TB clinic. Information on where to make such referrals can be obtained by calling the state TB Program (566-3099). ***No one who is discharged on preventive therapy should be prescribed more than a one month supply of INH at a time.***
- . No one should be denied preventive therapy because of cost considerations. Free INH and other antituberculosis drugs can be obtained from the state TB Program (566-3099). For persons who have no third party coverage for TB preventive care, the state TB Program will reimburse at Medicaid rates for follow-up services including chest x-rays, blood work and physician and home visits.

TRAINING AND EVALUATION

- . The pulmonary and/or infectious disease staff at each hospital should be responsible for ensuring that staff who will be administering tuberculin and anergy skin tests are properly trained to place, read, record and interpret them. The state TB Program and the American Lung Association of CT have copies of the CDC video, "Tuberculin Skin Testing", which can supplement efforts to refresh house staff and nursing staff in tuberculin skin test administration, reading and interpretation. In addition, copies of the CDC-developed "Core Curriculum on Tuberculosis" with accompanying slides are similarly available for use by pulmonary, infectious disease or other staff for training of those who need tuberculosis-specific information.
- . Once an effort is made to adopt these recommendations, each hospital should evaluate the extent to which skin testing is occurring, the prevalence of positive tests, the extent to which persons found to be positive are receiving appropriate evaluation, are being started on preventive therapy and are being successfully referred for continuation of therapy after discharge. The state TB Program is available to assist in the planning and interpretation of this type of program evaluation.

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