CHI
CITY HEALTH INFORMATION
THE NEW YORK CITY DEPARTMENT OF HEALTH
CME ACTIVITY INSIDE
October 2000 Vol. 19 No. 3

TESTING & TREATMENT for Latent Tuberculosis Infection

Despite the dramatic decline in the number of reported cases of tuberculosis (TB) in New York City, many New Yorkers remain at high risk for developing active tuberculosis disease, once infected with *Mycobacterium tuberculosis.* Groups at especially high risk include contacts of persons with active tuberculosis, HIV-infected persons, individuals with certain predisposing medical conditions, and recent immigrants from countries with high rates of TB.

In spring 2000, the American Thoracic Society (ATS) and the Centers for Disease Control and Prevention (CDC) published revised guidelines for testing for and treating latent tuberculosis infection *(see Reference 1).* These guidelines are endorsed by the Infectious Diseases Society of America and the American College of Physicians. Sections that relate to infants and children are endorsed by the American Academy of Pediatrics.

The CDC/ATS revised guidelines refer to "treatment of latent tuberculosis infection (LTBI)" instead of "preventive therapy" and recommend:

1. *That a tuberculin skin test (TST) be performed only if a plan has been developed for ensuring that those with a positive test complete treatment* ***(a decision to test is a commitment to treat!)****;*
2. *That the duration of treatment for latent TB infection be changed for both HIV-positive and HIV-negative adults;*

Photos by Raya Dueñas and Walter Racelis

3. *That treatment regimens other than isoniazid alone be considered for adults;*
4. *That all TST-positive individuals at high risk for progression to TB disease be considered for treatment, regardless of age.*

This issue summarizes and synthesizes the CDC/ATS recommendations for physicians and other health-care providers in New York City. It offers 10 "basics" and a pullout Guide on fundamental aspects of testing and treating latent TB infection, including when and how to administer therapy, how to interpret the TST in BCG-vaccinated individuals, and how to treat HIV-positive individuals who are taking antiretroviral agents.

When recommendations of the New York City Department of Health differ from, or elaborate upon, the ATS/CDC guidelines, the text is italicized in black boldface.

A Decision to Test Is a Commitment to Treat!

Acknowledgments. – Paula I. Fujiwara, M.D., M.P.H., Assistant Commissioner; Sonal S. Munsiff, M.D., Director of Epidemiology; and Dara Shapiro, M.P.H., Assistant Director of Public Health Education; Tuberculosis Control Program.

10 Basics For Testing and Treating LTBI

1 Target all tuberculin skin testing to persons at high risk for TB.

Target tuberculin skin testing (use the Mantoux method only) to identify (1) those who are at high risk of being *recently infected with M. tuberculosis*–and thus at high risk of developing active disease–and (2) those who, once infected, are at increased risk of *developing TB disease* because of medical conditions. The first group includes individuals:

- who are close contacts of people with infectious TB
- whose tuberculin skin tests have converted to positive within the past 2 years
- who have immigrated within the past 5 years from areas with high rates of TB *(see Step 1 of the Guide)*
- who live or work in institutional settings where they may be in contact with those with infectious TB disease

The second group comprises individuals who have underlying medical conditions that substantially increase their risk of developing active TB disease, if infected. This group includes persons with HIV infection, injection drug users, and persons with evidence of old, healed TB lesions in their chest X-rays.

Routine tuberculin skin testing of persons at low risk for TB infection or disease is not recommended. *(See Step 1 of the Guide.)*

2 Know when to test.

Guidelines for testing of specific high-risk groups are as follows:

- *Close contacts of persons with active TB disease* should receive a baseline TST immediately after learning of exposure. Retesting is sometimes necessary, however, to determine whether or not infection resulted from the exposure. Because it can take up to 12 weeks after *M. tuberculosis* infection for the immune system to respond to the skin test, a TST given during the 12-week window period may be falsely negative. Close contacts tested during the window period who had a negative result on the initial TST should be retested 12 weeks from the contact's most recent exposure to active TB.
- *All HIV-positive individuals* should receive a TST as soon as possible after HIV infection is diagnosed and at least every 12 months thereafter *(see References 3 and 4 and Point 7).*
- *Recent immigrants from countries with high rates of TB* (those who have been in United States <5 years) should receive a skin test the first time they enter the medical care system in the U.S. and anytime they return to the U.S. after a prolonged (>1 month) stay abroad in areas with high TB rates (*see Step 1 of the Guide).*
- Recommendations for how frequently to test *individuals who live or work in institutional settings* (e.g., prisons, hospitals) vary according to risk of transmission *(see References 8-10).*

Tuberculin skin testing should only take place when a plan has been developed for persons to complete a course of treatment if found to have latent TB infection. ***A decision to test is a commitment to treat!***

3 Determine if the tuberculin skin test is positive.

Based on the size of the induration, there are three cutoff points for defining a positive result: ≥ 5, ≥ 10, and ≥ 15 millimeters of induration *(see Step 2 of the Guide).* For individuals who are at highest risk of developing TB disease if infected with *M. tuberculosis,* a ≥ 5 mm induration is considered positive. An induration of ≥10 mm should be considered positive for groups with an increased probability of developing TB disease. Routine tuberculin testing is not recommended for populations at low risk of latent TB infection; however, if these persons are tested, a higher cutoff of ≥ 15 mm is recommended.

4 Test all people who are high risk, even if they had BCG.

The tuberculin skin test is not contraindicated for persons who have been vaccinated with BCG, and a history of vaccination with BCG should not be considered when deciding whether to test and determining whether the TST result is positive in high-risk individuals (*see Point 3 and Step 2 of the Guide).*

Although BCG vaccination can cause a false-positive cross reaction to the TST (especially within the first 12 months after vaccination), sensitivity to tuberculin is highly variable and tends to wane over time. There is no way to distinguish between a positive reaction due to BCG-induced sensitivity and a positive reaction due to true latent TB infection. Therefore, a positive reaction to the TST in BCG-vaccinated persons should be interpreted as indicating infection with *M. tuberculosis* when the person tested is at increased risk of recent infection or has a medical condition that increases the risk of progression to active TB disease.

5 Rule out active TB disease in persons with positive skin tests.

Any individual with a newly identified positive skin test should be evaluated for TB disease with a medical examination and a chest X-ray *(see Step 3 of the Guide).* If the chest X-ray is normal and the person has no symptoms consistent with active TB, he or she may be a candidate for treatment of LTBI. Regardless of their age, high-risk individuals with positive skin tests should receive treatment for LTBI (*see Point 6.)* An individual with TB symptoms or abnormal chest X-ray should have a sputum examination or an appropriate evaluation for extra-pulmonary involvement in order to rule out active TB disease.

6 Forget the past age "limit" of 35 years. (It was never meant to discourage treatment of high-risk persons!) Provide treatment for all high-risk individuals diagnosed with latent TB infection, no matter what their age *(see Point 1).*

High-risk individuals fall into two categories: (1) people presumed to be recently infected, and (2) people whose underlying medical conditions substantially increase their risk of developing active TB disease *(see Step 1 of the Guide).* All high-risk individuals with a positive tuberculin skin test *(see Step 2)* for whom TB disease has been ruled out should be considered for treatment for latent TB infection, regardless of age.

There are four recommended regimens for the treatment of LTBI in adults *(see Step 4 of the Guide).* Close contacts of persons with active TB who are tested during the 12-week window period and (1) HIV-infected or (2) younger than 5 years old *(see Point 2)* should be evaluated for TB disease with a chest X-ray and medical exam, regardless of their TST results. If active TB disease is ruled out, individuals in both these groups should start treatment for presumed latent TB infection. If TST results remain negative after the window period, treatment for LTBI should be discontinued in children. *(Also see Points 7 and 8.)*

An individual not at high risk for developing TB disease who has been inadvertently tested should generally not be considered for treatment, even if the TST result is positive.

7 Take special care when testing and treating HIV-positive individuals.

The management of persons co-infected with HIV and LTBI is highly complex and should be attempted only in consultation with physicians expert in the treatment of both. In order to provide optimal treatment for both infections, HIV- and tuberculosis-care providers should communicate closely with each other.

HIV-positive persons who have had recent close contact with an infectious TB patient should receive treatment for LTBI *(see Steps 4 and 5 of the Guide)* regardless of age, results of TSTs, or history of previous treatment for LTBI. HIV-positive individuals with a history of prior untreated or inadequately treated TB disease should be re-evaluated for active disease and, if negative for active TB, receive treatment for LTBI, regardless of age or results of TSTs.

If isoniazid (INH) is chosen as the LTBI regimen, 9 months of therapy is recommended. A 2-month regimen containing rifampin and pyrazinamide may also be used.

When prescribing rifampin, it should be noted that patients with HIV infection often are being treated with protease inhibitors (PIs) and non-nucleoside reverse transcriptase inhibitors (NNRTIs). PIs and NNRTIs are generally contraindicated with rifampin because of significant drug interactions. In some cases, rifabutin can be substituted for rifampin. Rifabutin may be used concurrently with protease inhibitors *amprenavir (Agenerase®), indinavir (Crixivan®),* and *nelfinavir (Viracept®).* Rifabutin also may be used with *ritonavir (Norvir®)* and *saquinavir (Invirase®)* if the protease

inhibitors are administered together. Rifabutin may be used with NNRTIs *efavirenz (Sustiva®)* and *nevirapine (Viramune®)*. For the recommended dosages of rifabutin when it is coadministered with these agents, *see Step 5 of the Guide.* **Interactions between rifamycins and antiretroviral regimens containing other PI combinations and PI/NNRTI combinations have not been studied. The effect of these combinations may be unpredictable. If patients need these combinations while receiving anti-TB treatment, it may be necessary to use alternatives to rifampin and rifabutin.**

There are some differences between the CDC recommendations and those of the New York City Department of Health (NYC DOH). The major ones are:

- ***CDC states that it is probably acceptable to use rifampin with efavirenz. In this setting, the CDC recommends increasing the dose of efavirenz to 800 mg, as the efavirenz exposure is decreased by about 25% when given with rifampin. The NYC DOH does not recommend administering efavirenz and rifampin together, as higher doses of efavirenz may be associated with higher toxicity.***
- ***CDC states that is probably acceptable to use rifampin with ritonavir, whether it is given as the sole PI or along with saquinavir. The NYC DOH does not recommend this, as data on concurrent use of this combination are based on only two patients.***
- ***CDC states that it is probably acceptable to use Fortovase® (saquinavir soft gel capsules) with rifabutin without a dose change in either drug. However, the NYC DOH does not recommend the coadministration of these drugs. The use of rifabutin with saquinavir soft gel capsules has shown a 47% decrease in the exposure of saquinavir. The NYC DOH is concerned that this is a significant enough decrease in the exposure of saquinavir that the two drugs ought not to be used together.***

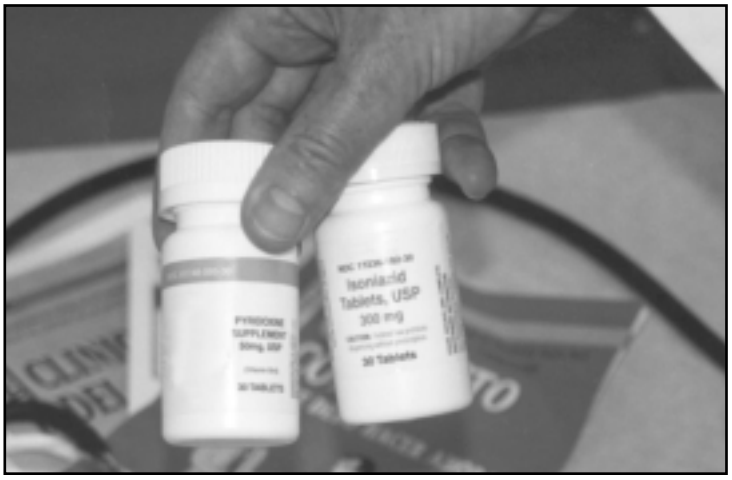
Information on interactions between rifamycins and antiretroviral drugs is constantly evolving, and since recommendations are often based on anecdotal evidence, differences in opinion will continue to exist until better data become available. As more data and new drugs emerge, it is essential that clinicians obtain the most current information regarding TB and HIV drug interactions.

8 Carefully consider treatment for pregnant women, children, and contacts of persons with multidrug-resistant TB.

Pregnant women should receive a tuberculin skin test only if they are in a high risk category (see Step 1 of the Guide). Although the need for treatment of active TB during pregnancy is unquestioned, the treatment of LTBI in pregnant women is more controversial because the possible risk of isoniazid hepatotoxicity must be weighed against the risk of developing active TB. In general, treatment of LTBI should be delayed until after delivery. However, for women who are HIV-positive or who have been infected recently, initiation of therapy should not be delayed on the basis of pregnancy alone, even during the first trimester. The preferred regimen for treatment of LTBI in pregnant women is INH (daily or twice weekly). Extensive use of INH during pregnancy has indicated that the drug is not teratogenic, even when given during the first 4 months of pregnancy. Pregnant women taking INH should receive vitamin B_6. In general, pyrazinamide should not be used for the treatment of LTBI in pregnant women.

Children younger than 5 years with LTBI have by definition been infected "recently" and are at high risk for progression to active TB disease. According to the American Academy of Pediatrics, the recommended regimen for children (with or without HIV infection) is 9 months of INH (10 mg/kg daily with a maximum of 300 mg, or 20-30 mg/kg twice weekly with a maximum of 900 mg). The risk for isoniazid-related hepatitis is minimal in infants and children, who generally tolerate the drug better than adults. Vitamin B_6 should be given to HIV-infected children treated with INH. ***The NYC DOH recommends that children (with or without HIV infection) exposed to INH-resistant, rifampin-susceptible TB be treated with at least 6 months of rifampin (10-20 mg/kg daily or twice weekly with a maximum dose of 600 mg).***

Contacts of persons with multidrug-resistant TB (MDRTB) are unlikely to benefit from treatment with isoniazid or rifampin. Therefore, a regimen containing other drugs active against *M. tuberculosis* should be considered. When possible, selection of drugs should be guided by in vitro susceptibility test results of an isolate obtained from the person to whom the patient was exposed. Immunocompetent contacts may be observed without treatment or treated for at least 6 months. HIV-infected persons should be treated for 12 months. All persons with suspected MDRTB infection should be followed for at least 2 years, irrespective of treatment. Expert consultation should be sought for the treatment of persons exposed to persons with MDRTB.



9 Consider treatment for individuals with evidence of old, healed TB.

Individuals with no history of adequate treatment of TB who have (1) a TST reaction of ≥5 mm and (2) a chest X-ray that shows noncalcified fibrotic lesions suggestive of old, healed TB or silicosis are unlikely to have current TB disease. ***The NYC DOH recommends that these individuals be given one of the following regimens, depending on HIV status and TB treatment history:***

- ***HIV-negative persons without a history of prior TB treatment should receive isoniazid, rifampin, pyrazinamide, and ethambutol for 2 months followed by isoniazid and rifampin for 2 months;***
- ***HIV-positive persons and persons with a history of prior treatment with anti-TB medications should receive all 4 drugs for the entire 4 months.***

The CDC recommends three possible regimens for individuals with evidence of old, healed TB and no history of treatment for TB:

- ***9 months of isoniazid,***
- ***2 months of rifampin and pyrazinamide, or***
- ***4 months of rifampin (with or without isoniazid).***

For patients who begin multidrug therapy for suspected pulmonary TB but are subsequently determined not to have active disease, the CDC recommends completion of treatment with at least 2 months of a regimen containing rifampin and pyrazinamide if the tuberculin skin test is positive and other causes of the radiographic abnormalities have been excluded.

10 Monitor all patients carefully during the treatment of LTBI.

All patients receiving treatment for latent TB infection should be monitored clinically. This involves education of patients about the symptoms and signs of adverse drug reactions and the need for prompt cessation of treatment and clinical evaluation should symptoms occur. Symptoms and signs could include: unexplained anorexia, nausea, vomiting, dark urine, icterus, rash, persistent paresthesias of the hands and feet, persistent fatigue, weakness or fever lasting 3 days or more, abdominal tenderness (especially right upper quadrant discomfort), easy bruising or bleeding, and arthralgia.

At baseline, a complete blood cell count and liver function tests (LFTs) should be done for all of the following patients:

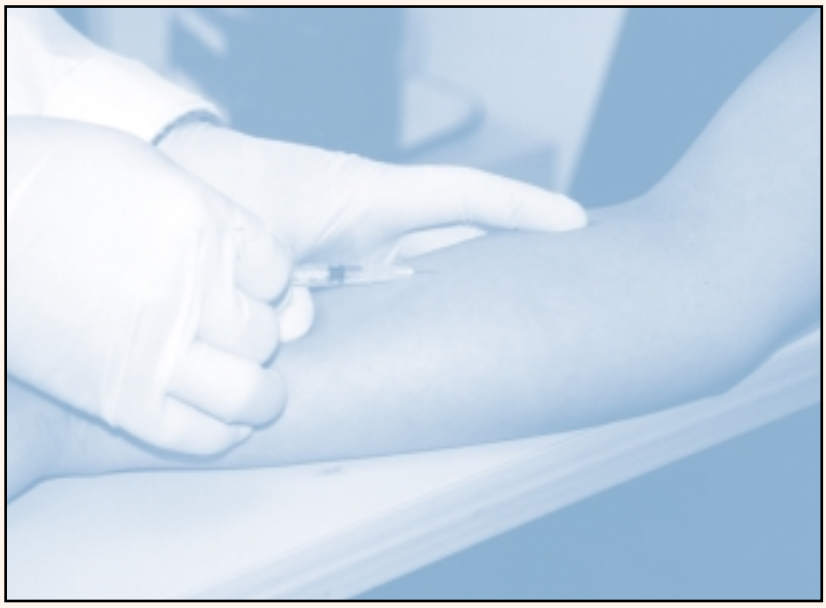
- HIV-positive patients
- Patients with a history of heavy alcohol ingestion, liver disease, or chronic hepatitis
- Pregnant and postpartum women (up to 2-3 months after delivery)
- Patients with a history of drug injection
- ***Patients older than 35 years (if taking INH)***
- ***Patients starting treatment with 2 or more anti-TB drugs***

Monthly liver function tests should be conducted for all HIV-positive patients; patients with a history of heavy alcohol ingestion, liver disease, or chronic hepatitis; pregnant and postpartum women (up to 2-3 months after delivery); and patients currently injecting drugs.

In addition, laboratory testing should be used to evaluate specific adverse events that may occur during treatment.

CHI
City Health Information
The New York City Department of Health
SUPPLEMENT
October 2000 Vol. 19 No. 3

A Guide to Tuberculin Skin Testing and the Treatment of Latent Tuberculosis Infection



ALSO INSIDE:

A Continuing Medical Education Activity for 2.0 Credits

A Guide to Tuberculin Skin Testing and the Treatment of Latent Tuberculosis Infection

STEP 1:

Know Which Persons Are at High Risk for TB Infection or Disease and Should Be Tested for Latent TB Infection

Individuals Who May Have Been Recently Infected	Individuals With Clinical Conditions Associated With Progression From LTBI to Active TB
• Close contacts of persons with active TB • Persons whose TSTs have converted to positive (≥10 mm increase) within the past 2 years • Persons who have immigrated within the past 5 years from areas with high rates of TB* • Persons who live or work in institutional settings where TB exposure may be likely (e.g., hospitals, prisons, homeless shelters, nursing homes) • Children <5 years exposed to adults in high-risk categories	• Persons with HIV infection • Injection drug users, particularly persons with HIV infection • Persons with evidence of old, healed TB lesions on chest X-ray • Underweight persons (≥10% under ideal body weight) • Persons with clinical conditions that lead to a stressed or incompetent immune system (e.g., silicosis, chronic renal failure, diabetes mellitus) • Persons receiving prolonged corticosteroid or other immunosuppressive therapy

***Areas/countries with high rates of TB:** Africa (all countries *except* Seychelles); Afghanistan, American Samoa, Argentina, Armenia, Azerbaijan, Bahamas, Bahrain, Bangladesh, Belarus, Belize, Bhutan, Bolivia, Bosnia-Herzegovina, Brazil, Brunei, Cambodia, China (including Hong Kong), Christmas Island, Colombia, Cook Islands, Croatia, Djibouti, Dominican Republic, Ecuador, El Salvador, Estonia, Fiji, French Polynesia, Georgia, Guam, Guatemala, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Iraq, Iraq-Saudi Arabia Neutral Zone, Kampuchea (Cambodia), Kazakhstan, Kiribati, Korea (Republic of), Kyrgyzstan, Laos, Latvia, Lithuania, Macao (China), Macedonia, Malaysia, Maldives, Marshall Islands, Mesopotamia, Moldova, Mongolia, Morocco, Myanmar, Nauru, Nepal, New Caledonia, Nicaragua, Niue, Northern Mariana Islands, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Portugal, Romania, Russia, Samoa, Saudi Arabia, Singapore, Solomon Islands, Somalia, Spain, Sri Lanka, Sudan, Suriname, Syria, Tajikistan, Thailand, Tonga, Turkmenistan, Tuvalu, Ukraine, USSR (now CIS), Uzbekistan, Vanuatu, Vietnam, Wallis & Futuna, West Bank and Gaza, Yemen, and Yugoslavia. **Source:** Global Tuberculosis Programme, World Health Organization. *Global Tuberculosis Control: WHO Report 2000*. Geneva: World Health Organization; 2000.

High-incidence areas are defined by the New York City Department of Health as areas with ≥ 20 reported or estimated smear-positive cases per 100,000 persons. Most areas not listed should be considered low incidence. However, the following should not necessarily be considered low incidence because no data were available: Açores Islands, Ashmore & Cartier Islands, Baker Island, Cayman Islands, Clipperton Island, Cocos (Keeling) Island, Coral Sea Islands, Europa Islands, Faroe Islands, Falkland Islands-Isles Malvinas, Greenland, Guadeloupe, Howland Islands, Jan Mayen Island, Jarvis Island, Johnston Atoll, Kingman Reef, Liechtenstein, Madeira Islands, Martinique, Midway Island, Montserrat, Navassa Island, New Hebrides, Norfolk Island, Palmyra Atoll, Paracel Islands, Pitcairn Island, St. Barthelemy, St. Helena, St. Pierre and Miquelon, San Marino, Spratly Islands, Svalbard and Jan Mayen, Taiwan (China), Tokelau, Tromelin Island, Turks and Caicos Islands, Wake Island, and Western Sahara.

STEP 2:

Determine if the Tuberculin Skin Test Is Positive

The Following Measurements of Induration Are Classified as Positive

≥5 mm for	• Persons with HIV infection • Recent contacts of persons with active TB • Persons with evidence of old, healed TB lesions on chest X-rays • Patients with organ transplants and other immunosuppressed persons
≥10 mm for	• Persons who have immigrated within the past 5 years from areas with high rates of TB *(see Step 1)* • Injection drug users • Persons who live or work in institutional settings where exposure to TB may be likely (e.g., hospitals, prisons, homeless shelters, nursing homes) • Mycobacteriology laboratory personnel • Persons with clinical conditions associated with progression to active TB, including silicosis, chronic renal failure, diabetes mellitus, weight loss of ≥10% of ideal body weight, gastrectomy, carcinoma of the head, neck, or lung • Children <5 years of age or children/adolescents exposed to adults in high-risk categories
≥15 mm for	• Persons at low risk for TB disease for whom testing is not generally indicated

STEP 3:

Evaluate for TB Disease

- Any person with a newly positive TST result should be evaluated for TB disease with a medical examination and a chest X-ray.
- To report a case of suspected or confirmed TB disease to the Health Department, call (212) 788-4162. Positive tuberculin skin tests in children younger than 5 years must also be reported.

STEP 4:

Give Treatment for Latent TB Infection

Recommended Regimens for Treatment of Latent TB Infection in Adults Aged 18 Years and Older*

Drug	Duration	Adult dosage *(maximum dosage)*		Criteria for Completion		Comments
		Daily	Twice Weekly	Daily	Twice Weekly	
Isoniazid (INH)	9 months	5 mg/kg *(300 mg)*	15 mg/kg *(900 mg)*	270 doses within 12 months	76 doses within 12 months	• Preferred over INH for 6 months for all individuals.
Isoniazid	6 months	5 mg/kg *(300mg/kg)*	15 mg/kg *(900 mg)*	180 doses within 9 months	52 doses within 9 months	• For HIV-negative adults, this 6-month regimen is an acceptable alternative to the 9-month INH regimen and may provide a more cost-effective outcome. • NOT recommended for HIV+ persons, children <18 years of age, and those with fibrotic lesions consistent with TB on chest X-rays.
Rifampin (RIF) plus Pyrazinamide (PZA)	2 months**	10 mg/kg *(600 mg)* 15-20 mg/kg *(2.0 g)*	10 mg/kg *(600 mg)* 2.5g (<50kg) 3.0g (51-74kg) 3.5g (75+kg)	60 doses within 3 months	16 doses within 3 months	• May be offered to contacts of patients with INH-resistant TB. • In HIV+ persons, RIF generally should not be coadministered with protease inhibitors and NNRTIs; in some cases rifabutin may be substituted *(see Point 7 and Step 5).* • In general, PZA should not be used to treat LTBI in pregnant women.
Rifampin	4 months	10 mg/kg *(600 mg)*		120 doses within 6 months		• For persons who cannot tolerate PZA. *See Point 8 for rifampin regimen for children.*

See Point 8 for LTBI regimens for children.** *****CDC/ATS guidelines state that RIF plus PZA given twice weekly should be administered for 2 to 3 months. New York City Department of Health guidelines state that RIF plus PZA be given for 2 months, whether administered daily or twice weekly.

STEP 5:

Adjust Treatment in HIV-Positive Patients on Antiretroviral Agents*

Protease Inhibitors and Non-Nucleoside Reverse Transcriptase Inhibitors That Can Be Used Concurrently With Rifabutin	Rifabutin Dosage
Amprenavir (Agenerase®), Indinavir** (Crixivan®), and Nelfinavir (Viracept®)	150 mg (daily) or 300 mg (intermittently)
Efavirenz (Sustiva®)	600 mg (daily or intermittently)
Nevirapine (Viramune®)	300 mg (daily or intermittently)
Ritonavir (Norvir®) and Saquinavir (Fortovase®), if administered together, each at a dose of 400 mg BID	150 mg (intermittently)

***Rifampin is generally contraindicated with all currently available PIs and NNRTIs–*see Point 7.**

****Increase dosage of indinavir to 1000 mg every 8 hours when coadministered with rifabutin.**

Fold Before Tearing

Fold, Detach, and Mail

Continuing Medical Education Activity

Sponsored by the New York City Department of Health

Testing and Treatment for Latent Tuberculosis Infection

Objective

This issue of City Health Information provides information and recommendations on testing for and treating latent tuberculosis infection. Completion of this CME activity will enable physicians and other health-care providers to a) identify risk factors for infection and progression to active TB disease; b) interpret tuberculin skin test results; and c) treat individuals for latent tuberculosis infection, including those who are HIV-infected.

Accreditation

This CME activity is open to physicians (MDs, DOs), physician assistants, nurse practitioners, and nurses. The New York City Department of Health is accredited by the Medical Society of the State of New York to sponsor continuing medical education for physicians. The New York City Department of Health designates this continuing medical education activity for **2.0** hours in Category One credit towards the AMA/PRA (Physician's Recognition Award). Each physician should claim only those hours of credit that he/she actually spent in the educational activity. This Education Design II activity has also been approved for **2.0 C.H.** by the New York State Nurses Association's Council on Continuing Education, which is accredited by the American Nurses' Credentialing Center's Commission on Accreditation.

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 2379 NEW YORK NY

POSTAGE WILL BE PAID BY ADDRESSEE

CME Administrator
New York City Department of Health
125 Worth Street, CN #12
New York, NY 10213–0288

ANSWER KEY

Please place an "X" in the box next to your answer for each of the corresponding questions.

1. ❑ A ❑ B ❑ C

2. ❑ A ❑ B ❑ C

3. ❑ A ❑ B ❑ C

4. ❑ A ❑ B ❑ C ❑ D ❑ E

5. ❑ A ❑ B ❑ C ❑ D ❑ E

6. ❑ A ❑ B ❑ C

Please indicate degree: ❑ **M.D.** ❑ **D.O.** ❑ **P.A.** ❑ **N.P.** ❑ **R.N.**

Name _____

Address _____

City _____ **State** _____ **ZIP Code** _____

Telephone (_____) _____

Expiration–May 1, 2001

For eligibility to receive continuing medical education credit, the response card or a photocopy of the card must be completed and returned by fax or by mail, postmarked no later than May 1, 2001. This issue of CITY HEALTH INFORMATION, including this continuing medical education activity, is also available on the Internet for downloading (but not for electronic response) at www.nyc.gov/health.

Instructions

1. Read this issue of CITY HEALTH INFORMATION, which contains the correct answers to the questions on this page.

2. Complete all information on the response card, including your name, mailing address, and phone number.

3. Select your answers to the questions, and check the corresponding boxes on the response card. To receive continuing medical education credit, you must answer all questions, and 4 of the first 5 questions must be answered correctly. You will receive a CME or CNE certificate for 2.0 hours and a list of answers to the questions.

4. Return the response card or a photocopy of the card postmarked no later than May 1, 2001. Fax to (212) 442-3535 or mail to: CME Administrator, New York City Department of Health, 125 Worth Street, CN #12, New York, N.Y. 10213-0288.

Fold, Detach, and Mail

Fold Before Tearing

1. An Ecuadorean man, aged 23 years, has been living in New York City for 3 years. He is having a medical exam for the first time in the U.S. because his new employer, a construction company, requires one. *(Check one best answer.)*

   A. The physician should not give the patient a tuberculin skin test.

   B. The physician should give the patient a tuberculin skin test, and if the test is positive and active TB disease is ruled out, treat for LTBI.

   C. Physician should give the patient a tuberculin skin test, but should not treat for LTBI, even if test is positive and active TB disease is ruled out.

2. A Chinese woman, aged 55 years, has been living in the U.S. for 2 years. She received a BCG vaccine in China when she was a young child. She presents with a tuberculin skin test induration of 11 mm. Her chest X-ray is normal. *(Check one best answer.)*

   A. The patient should not be treated for latent TB infection.

   B. The patient should be treated for latent TB infection.

   C. The patient should be treated for active TB disease.

3. An American-born male, aged 65 years, has been a resident of a nursing home for 7 years. He presents with a skin test induration of 12 mm. When he entered the nursing home his skin test induration was 5 mm. His chest X-ray is normal. *(Check one best answer.)*

   A. The patient should not be treated for latent TB infection.

   B. The patient should be treated for latent TB infection, if he has a medical condition associated with high risk of developing TB disease.

   C. The patient should be treated for active TB disease.

4. An HIV-positive man has a tuberculin skin test reaction of 6 mm, a negative chest X-ray, and no symptoms of TB. He is currently taking an antiretroviral regimen for HIV infection that includes efavirenz and a protease inhibitor. What TB-related treatment should he receive? *(Check one best answer.)*

   A. Isoniazid (300 mg daily) for 9 months.

   B. Rifampin (600 mg daily) and pyrazinamide (2.0 g daily) for 2 months.

   C. Rifabutin (600 mg daily) and pyrazinamide (2.0 g daily) for 2 months.

   D. Isoniazid (300 mg daily) and pyrazinamide (2.0 g daily) and streptomycin (15 mg/kg daily) for 9 months.

   E. Does not need treatment.

5. Which individuals are at high risk for developing active TB, if infected? *(Check all that apply.)*

   A. HIV-positive individuals

   B. Close contacts of active TB cases

   C. Children <5 years old

   D. Pregnant women in their first trimester

   E. Injection drug users

6. How well did this Continuing Medical Education Activity achieve its educational objective?

   A. Very well B. Adequately C. Poorly

A Directory of Tuberculosis-Care Resources

The New York City Department of Health

Reporting

TB Hotline for Physicians .....**(212) 788-4162**
To report a suspected or confirmed case of tuberculosis and to obtain information on the treatment and drug susceptibility of your TB patient.
Fax (212) 788-4179

Directly-Observed Therapy

Information .....**(212) 442-9777**
Assistance in arranging a program for your patient.

Laboratory Services

Mycobacteriology Reference Laboratory.....**(212) 447-6745**
To submit specimens and cultures and to obtain test results of previous submissions.

Education

Information .....**(212) 442-9968**
For questions about tuberculosis, for copies of Department of Health publications, and to obtain training information and educational materials in English and other languages.

Chest Centers

Free, confidential, state-of-the-art care for patients with tuberculosis, their contacts, and other persons at risk for TB infection. Some centers are open on Saturdays and on some late nights. Call center for hours. Phone numbers may change; call **(212) 442-9968** *for updated numbers.*

Bronx/ Staten Island Network

Morrisania .....**(718) 901-6536, 6538**
1309 Fulton Avenue, Bronx, NY 10456
Fax (718) 590-6736

Richmond.....**(718) 983-4530**
51 Stuyvesant Place, Staten Island, NY 10301
Fax (718) 983-4529

Brooklyn Network

Bedford .....**(718) 574-2462, 2463**
485 Throop Avenue, Brooklyn, NY 11221
Fax (718) 455-1895

Brownsville .....**(718) 495-7256,7258**
259 Bristol Street, Brooklyn, NY 11212
Fax (718) 346-8255

Fort Greene .....**(718) 643-8357,6551**
295 Flatbush Avenue Extension, Brooklyn, NY 11201
Fax (718) 643-6367

Manhattan Network

Chelsea.....**(212) 239-1749, 1757**
303 Ninth Avenue, New York, NY 10001
Fax (212) 290-2324

Washington Heights .....**(212) 304-5435**
600 W. 168th Street, New York, NY 10032
Fax (212) 740-9162

Queens Network

Corona .....**(718) 476-7635,7636**
34-33 Junction Boulevard, Jackson Heights, NY 11372
Fax (718) 476-7818

Far Rockaway .....**(718) 474-2100, 2101**
67-10 Rockaway Beach Boulevard, Far Rockaway, NY 11692
Fax (718) 945-2596

Division of TB Elimination.....**(404) 639-1820**
http://www.cdc.gov/nchstp/tb
For CDC publications and other information.

National Jewish Medical and Research Center

Information.....**(800) 423-8891**

Clinical Consultation .....Ext. 1279
Mycobacteriology .....Ext. 1339
Pharmacokinetics .....Ext. 1925

References and Additional Reading

1. American Thoracic Society and Centers for Disease Control. Targeted tuberculin testing and treatment of latent tuberculosis infection. *Am J Respir Crit Care Med.* 2000; 161(4) S221-S247.
2. New York City Department of Health, Tuberculosis Control Program. *Clinical Policies and Protocols.* 3rd edition. June 1999.
3. New York State Department of Health AIDS Institute. Criteria for the medical care of adults with HIV infection. 4th edition. March 2000.
4. Centers for Disease Control and Prevention. Prevention and treatment of tuberculosis among patients infected with human immunodeficiency virus: Principles of therapy and revised recommendations. *MMWR.* 1998;47(RR-20).
5. Centers for Disease Control and Prevention. Updated guidelines for the use of rifabutin or rifampin for the treatment and prevention of tuberculosis among HIV-infected patients taking protease inhibitors or nonnucleoside reverse transcriptase inhibitors. *MMWR.* 2000;49(09):185-189.
6. Munsiff SS, Fujiwara PI. Treatment of tuberculosis in patients taking antiretrovirals. *AIDS Reader.* 2000;10(2):102-108. Errata. 2000; 10(4):206.
7. American Academy of Pediatrics. *2000 Red Book: Report of the Committee on Infectious Diseases.* 25th edition. Elk Grove Village, IL: American Academy of Pediatrics; 2000.
8. Centers for Disease Control and Prevention. Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health-care facilities. *MMWR.* 1994;43(RR-13).
9. Centers for Disease Control and Prevention. Prevention and control of tuberculosis in correctional facilities. Recommendations of the Advisory Council for the Elimination of Tuberculosis. *MMWR.* 1996;45(RR-8).
10. Centers for Disease Control and Prevention. Prevention and control of tuberculosis in facilities providing long-term care to the elderly. Recommendations of the Advisory Council for Elimination of Tuberculosis. *MMWR.* 1990;39(RR-10).

CITY HEALTH INFORMATION Vol. 19 No. 3 October 2000

Published by the New York City Department of Health, CITY HEALTH INFORMATION features descriptive data, analysis, and reports from the Health Department about public health issues of interest to the medical community.

Cortnie Lowe, M.F.A.
Editor

Katherine Kaye, M.D., M.P.H.
Associate Commissioner
Bureau of Medical and Professional Education and Training

Benjamin A. Mojica, M.D., M.P.H.
Deputy Commissioner
Division of Health

Neal L. Cohen, M.D.
Commissioner of Health

Rudolph W. Giuliani
Mayor

125 Worth Street, Rm. 315, CN 6, New York, N.Y. 10013 (212) 788-5394 Fax (212) 788-9810 www.nyc.gov/health

CITY HEALTH INFORMATION
THE NEW YORK CITY DEPARTMENT OF HEALTH

BULK RATE
U.S. POSTAGE
PAID
NEW YORK, N.Y.
PERMIT NO. 6174