ACHA Guidelines

Tuberculosis Screening and Targeted Testing of College and University Students

Purpose

Screening and targeted testing for tuberculosis (TB) is a key strategy for controlling and preventing infection on college and university campuses. Early detection provides an opportunity to promote the health of affected individuals through prompt diagnosis and treatment while preventing potential spread to others. Implementation of a screening and targeted testing program not only addresses this public health concern in campus communities but also contributes to the larger public health goal of reducing the burden of TB in the United States.

The intent of this document is to provide guidelines for screening the incoming student population, targeting those at increased risk for TB testing, and reviewing appropriate follow-up care for students diagnosed with latent TB infection (LTBI) or TB disease.

Definitions

In this document, "screening" refers to the process of identifying persons at high risk for TB infection and disease. Screening is conducted through a questionnaire where the student identifies any risk factors for TB infection and disease. "Testing" refers to the testing procedure for diagnosing LTBI, i.e., interferon gamma release assay (IGRA) or Mantoux tuberculin skin test (TST).

Risks for exposure to and/or infection with M. tuberculosis have been identified through epidemiological and population-based studies (see Table 1). A sample screening questionnaire has been developed based on these risk factors (see Appendix B). It is designed for use by institutions for the incoming student population, in order to appropriately target students at risk for TB who would benefit from testing.

Refer to Table 2 for those factors that place an individual who is infected with TB at higher risk for progressing to active disease. Typically, factors are identified in individuals by health care providers in the clinic setting. Those at risk for exposure should be tested and if positive, are high priorities for treatment.

Whom to Screen

All incoming students should be screened for risk factors for TB through a screening questionnaire. The United States is primarily a low-incidence country, so most U.S.-born incoming students will not have risk factors for TB and will not need TB testing. However, international students arriving from countries or territories with an increased incidence of TB should be tested because this subpopulation has been identified epidemiologically as having a higher incidence of LTBI and an increased risk for developing active TB disease.[1] While all incoming students should be screened, only those students with identifiable risk factors for exposure to TB and/or for TB disease should be tested. Incoming students at low risk should not be tested for TB. Students with a documented previous positive test should not be retested but may benefit from a review of their situation with a college health provider.

High-incidence areas are defined as countries or territories with an annual incidence of TB disease of greater than or equal to 20 cases per 100,000 population. Most countries in Africa, Asia, Central America, Eastern Europe, and South America are included in this group. See Appendix A for a current list of low-incidence countries and territories, as identified by the World Health Organization (WHO) Global Health Observatory.

While national trends indicate a decline in the overall number of TB cases since 1993, active disease transmission continues to occur. It is important to focus on local epidemiology to identify trends in individual states or regions. The epidemiology of TB among foreign-born populations differs considerably from area to area. To tailor TB-control efforts to local needs, TB-control programs should develop epidemiologic profiles to identify groups of persons in their jurisdictions who are at higher risk for TB. In 2009, approximately 60% of TB cases in the United States occurred in foreign-born individuals. For a list of high burden countries and their profiles, see WHO Tuberculosis Country Profiles at www.who.int/tb/country/data/profiles/en/.

[1] Centers for Disease Control and Prevention (CDC). Controlling Tuberculosis in the United States: Recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America. MMWR November 2005; 54 (No. RR-12):4-5.

TABLE 1: Persons at Higher Risk for Exposure to and/or Infection with *M. tuberculosis*
• Close contacts of persons known or suspected to have active TB disease • Foreign-born persons from areas that have a high incidence of active TB disease • Persons who visit areas with a high prevalence of TB disease, especially if visits are frequent or prolonged • Residents and employees of high-risk congregate settings (e.g., correctional facilities, long-term care facilities, and homeless shelters) • Health care workers who serve clients who are at increased risk for active TB disease • Populations defined locally as having an increased incidence of latent M. tuberculosis infection or active TB disease, possibly including medically underserved, low-income populations, or persons who abuse drugs or alcohol • Infants, children, and adolescents exposed to adults who are at increased risk for latent tuberculosis infection or active TB disease Source: Centers for Disease Control and Prevention (CDC), Division of Tuberculosis Elimination. Core Curriculum on Tuberculosis: What the Clinician Should Know: Chapter 1, Table 1.3. Persons at higher Risk for Exposure to and/or Infection with *M. tuberculosis*. 6th edition (2013). https://www.cdc.gov/tb/education/corecurr/pdf/corecurr_all.pdf Accessed February 15, 2020.

TABLE 2: Persons at Increased Risk for Progression of LTBI to TB Disease
• Persons infected with HIV • Children younger than 5 years of age • Persons who were recently infected with M. tuberculosis (within the past 2 years) • Persons with a history of untreated or inadequately treated TB disease, including persons with fibrotic changes on chest radiograph consistent with prior TB disease • Persons who are receiving immunosuppressive therapy such as tumor necrosis factor-alpha (TNF) antagonists, systemic corticosteroids equivalent to/greater than 15 mg of prednisone per day, or immunosuppressive drug therapy following organ transplantation • Persons with silicosis, diabetes mellitus, chronic renal failure, leukemia, or cancer of the head, neck, or lung • Persons who have had a gastrectomy or jejunoileal bypass • Persons who weigh less than 90% of their ideal body weight • Cigarette smokers and persons who abuse drugs and/or alcohol • Populations defined locally as having an increased incidence of disease due to M. tuberculosis, including medically underserved, low-income populations. Source: Centers for Disease Control and Prevention (CDC), Division of Tuberculosis Elimination. Core Curriculum on Tuberculosis: What the Clinician Should Know: Chapter 2, Table 2.6. Persons at Increased Risk for Progression of LTBI to TB Disease. 6th edition (2013). https://www.cdc.gov/tb/education/corecurr/pdf/corecurr_all.pdf Accessed February 15, 2020.

Continuing students should be tested only when their activities place them at risk for a new infection or to meet an academic programmatic requirement. While it would be welcomed, no evidence-based data exists that identifies the amount of time spent in a given high-risk country that constitutes significant exposure. Students should discuss the specific travel circumstances with a health care provider who can determine the appropriate evaluation.[2] Activities that may result in increased risk of exposure to TB may include, but are not limited to, volunteering, conducting research, mentoring, studying abroad, traveling, visiting relatives, or employment which may involve close contact with individuals in areas with increased incidence of TB whether

[2] Centers for Disease Control and Prevention (CDC). Guidelines for preventing the transmission of Mycobacterium tuberculosis in health-care settings, 2005. MMWR December 2005; 54 (No. RR-17):4-5.

domestically or internationally. Sponsors of these programs or health care providers caring for these students prior to the activity should educate students of this risk and recommend testing 8 to 10 weeks after leaving the high-incidence area.

TB screening of all health care personnel (HCP), including health profession students, includes a symptom evaluation and test (IGRA or TST) for those without documented prior TB disease or LTBI and an individual TB risk assessment to help guide decisions when interpreting test results. [3]

When to Screen and Test

TB screening should occur by questionnaire prior to arrival on campus in conjunction with verification of pre-matriculation immunization requirements. TB testing of high-risk students only should take place no sooner than six months prior to the start of the first semester and should be completed by the second quarter/semester registration.

How to Test

In most situations relevant to college health, the preferred method for testing for TB infection is an interferon-γ release assay (IGRA) rather than a tuberculin skin test (TST). A TST is an acceptable alternative, especially in situations where an IGRA is not available, too costly, or too burdensome. Importantly, persons at low risk for TB infection and disease progression are NOT recommended to be tested for TB infection. However, if testing of low risk students is required for administrative reasons, such as health professions program requirements, despite guidelines to the contrary, a confirmatory test is recommended if the initial test result is positive. The confirmatory test may be either an IGRA or a TST. When such testing is performed, the person is considered infected only if both tests are positive.

What to Do When the IGRA or TST Is Positive

Persons with a positive IGRA or TST must undergo chest radiography and medical exam to exclude active TB disease. For asymptomatic individuals, a posterior-anterior radiograph of the chest is the standard view used for the detection of TB-related chest abnormalities. In some cases, especially in children, a lateral view may be helpful. In some instances, a computerized tomography (CT) scan may provide additional information.[4] Any findings suggestive of active TB warrant further evaluation before treatment decisions can be made. In the absence of active TB disease, the diagnosis of LTBI is made using information gathered from the medical history, IGRA or TST result, chest radiograph, and physical examination.[5]

Whether to Treat LTBI

From a public health perspective, treatment of LTBI is essential to controlling and eliminating TB disease in the United States.[6] In deciding whether to recommend treatment of LTBI to individual patients, the clinician should weigh the likelihood of infection, the likelihood of progression to tuberculosis if infected, and the benefit of therapy. See ISDA LTBI treatment evaluation paradigm in Figure 1, below, for more information in making this important decision.

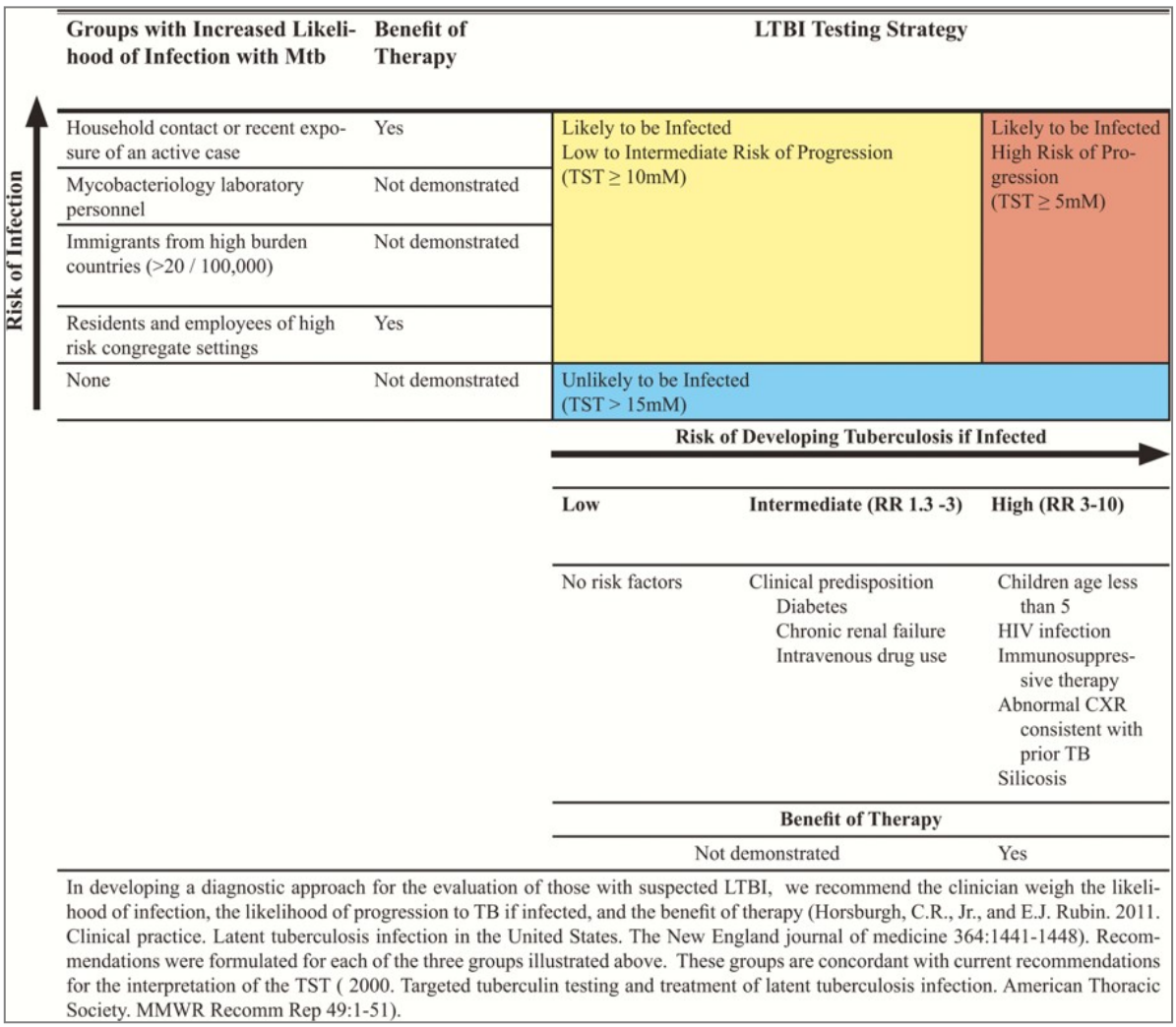
[3] Sosa LE, Njie GJ, Lobato MN, et al. Tuberculosis Screening, Testing, and Treatment of U.S. Health Care Personnel: Recommendations from the National Tuberculosis Controllers Association and CDC, 2019. MMWR Morb Mortal Wkly Rep 2019;68:439–443. DOI: http://dx.doi.org/10.15585/mmwr.mm6819a.

[4] CDC. Core Curriculum on Tuberculosis, Sixth Edition, 2013. Chapter 4, p 82.

[5] CDC. Latent Tuberculosis Infection: A Guide for Primary Health Care Providers. www.cdc.gov/tb/publications/ltbi/diagnosis.htm. Accessed February 15, 2020

[6] CDC. Core Curriculum on Tuberculosis: What the Clinician Should Know. www.cdc.gov/tb/education/corecurr/pdf/corecurr_all.pdf. Accessed February 15, 2020.

Figure 1.



Groups with Increased Likelihood of Infection with Mtb	Benefit of Therapy	LTBI Testing Strategy	
Household contact or recent exposure of an active case	Yes	Likely to be Infected Low to Intermediate Risk of Progression (TST ≥ 10mM)	Likely to be Infected High Risk of Progression (TST ≥ 5mM)
Mycobacteriology laboratory personnel	Not demonstrated		
Immigrants from high burden countries (>20 / 100,000)	Not demonstrated		
Residents and employees of high risk congregate settings	Yes		
None	Not demonstrated	Unlikely to be Infected (TST > 15mM)	

Risk of Infection

Risk of Developing Tuberculosis if Infected

Low	Intermediate (RR 1.3 -3)	High (RR 3-10)
No risk factors	Clinical predisposition Diabetes Chronic renal failure Intravenous drug use	Children age less than 5 HIV infection Immunosuppressive therapy Abnormal CXR consistent with prior TB Silicosis

Benefit of Therapy	
Not demonstrated	Yes

In developing a diagnostic approach for the evaluation of those with suspected LTBI, we recommend the clinician weigh the likelihood of infection, the likelihood of progression to TB if infected, and the benefit of therapy (Horsburgh, C.R., Jr., and E.J. Rubin. 2011. Clinical practice. Latent tuberculosis infection in the United States. The New England journal of medicine 364:1441-1448). Recommendations were formulated for each of the three groups illustrated above. These groups are concordant with current recommendations for the interpretation of the TST (2000. Targeted tuberculin testing and treatment of latent tuberculosis infection. American Thoracic Society. MMWR Recomm Rep 49:1-51).

Source: Lewinsohn, DM, et.al. 2017. Official American Thoracic Society/Infectious Diseases Society of America/Centers for Disease Control and Prevention Clinical Practice Guidelines: Diagnosis of Tuberculosis in Adults and Children. Clinical Infectious Diseases, Volume 64, Issue 2, 15 January 2017, Pages e1–e33, https://doi.org/10.1093/cid/ciw694

How to Treat LTBI

Short-course (3- to 4-month) rifamycin-based treatment regimens are preferred over longer-course (6–9 month) isoniazid monotherapy for treatment of LTBI because of their effectiveness, safety, and high treatment completion rates. These preferred regimens include

- 3 months of isoniazid plus rifapentine given once weekly (directly observed therapy)
- 4 months of rifampin given daily
- 3 months of isoniazid plus rifampin given daily

Note: 6 or 9 months of isoniazid monotherapy is efficacious but has higher toxicity risk and lower treatment completion rates than shorter rifamycin-based regimens.

Individual considerations, including comorbidities and medication interactions, should guide treatment decisions.[7]

Once initiated, completion of treatment should be a high priority and should be supported by providing education in the student's primary language, insuring confidentiality, offering incentives to mark treatment milestones, and case management by a culturally competent health care provider to build trust and gain buy-in.

[7] Sterling TR, Njie G, Zenner D, et al. Guidelines for the Treatment of Latent Tuberculosis Infection: Recommendations from the National Tuberculosis Controllers Association and CDC, 2020. MMWR Recomm Rep 2020;69(No. RR-1):1–11. DOI: http://dx.doi.org/10.15585/mmwr.rr6901a1

Post-treatment follow-up should include providing the student documentation of IGRA or TST results, chest radiograph results, and the dosage and duration of medication treatment. Students who have completed LTBI therapy, as well as those who elected not to take therapy, should be educated regarding signs and symptoms of TB disease and instructed to seek medical care immediately upon developing any of the signs or symptoms of TB.

Additional Resources

(in addition to footnotes)

ATS/CDC/IDSA. Treatment of Tuberculosis. MMWR June 2003; 52 (No. RR-11).

Francis J. Curry National Tuberculosis Center. TB Program Manual Template: www.currytbcenter.ucsf.edu/products/tuberculosis-program-manual-template

Heartland National Tuberculosis Center. Model Tuberculosis Prevention Program for College Campuses. 2nd ed. 2011. http://www.heartlandntbc.org/assets/products/model_tb_prevention_program_college_campuses.pdf

ACHA TB Screening Guidelines

Workgroup

These guidelines were prepared originally by ACHA's Tuberculosis Guidelines Task Force and revised by the ACHA Emerging Public Health Threats and Emergency Response Coalition. A special thanks to the following coalition members who worked on this latest revision: Thevy S. Chai, MD; Susan Even, MD, FACHA; Sharon McMullen, RN, MPH, FACHA; and Craig Roberts, MS, PA-C, FACHA.

AMERICAN COLLEGE HEALTH ASSOCIATION

APPENDIX A

"Low Incidence" Areas with Estimated or Reported Tuberculosis Incidence, 2018

"Low Incidence" areas are defined as areas with reported or estimated incidence of <20 cases per 100,000 population.

Albania
American Samoa
Andorra
Antigua and Barbuda
Aruba
Australia
Austria
Bahamas
Bahrain
Barbados
Belgium
Bermuda
Bonaire, Saint Eustatius and Saba
British Virgin Islands
Canada
Cayman Islands
Chile
Cook Islands
Costa Rica
Croatia
Cuba
Curaçao
Cyprus
Czechia
Denmark
Dominica
Egypt
Estonia
Finland
France
Germany
Greece
Grenada
Hungary
Iceland
Iran (Islamic Republic of)
Ireland
Israel
Italy
Jamaica
Japan
Jordan
Lebanon
Luxembourg
Malta
Mauritius
Monaco
Montenegro
Montserrat
Netherlands
New Caledonia
New Zealand
North Macedonia
Norway
Oman
Poland
Puerto Rico
Saint Kitts and Nevis
Saint Lucia
Saint Vincent and the Grenadines
Samoa
San Marino
Saudi Arabia
Serbia
Seychelles
Sint Maarten (Dutch part)
Slovakia
Slovenia
Spain
Sweden
Switzerland
Syrian Arab Republic
Tonga
Turkey
Turks and Caicos Islands
United Arab Emirates
United Kingdom of Great Britain and Northern Ireland
United States of America
Wallis and Futuna Islands
West Bank and Gaza Strip

Source: World Health Organization Global Health Observatory, Tuberculosis Incidence 2018. For future updates, refer to http://www.who.int/tb/country/en/.

APPENDIX B

Tool for Institutional Use

Part I: Tuberculosis (TB) Screening Questionnaire (to be completed by incoming students)

Please answer the following questions:

Have you ever had close contact with persons known or suspected to have active TB disease? ❑ Yes ❑ No

Were you born in one of the countries or territories listed below that have a high incidence of active TB disease? (If yes, please CIRCLE the country, below.) ❑ Yes ❑ No

Afghanistan	China, Macao SAR	Honduras	Myanmar	South Africa
Algeria	Colombia	India	Namibia	South Sudan
Angola	Comoros	Indonesia	Nauru	Sri Lanka
Anguilla	Congo	Iraq	Nepal	Sudan
Argentina	Democratic People's Republic of Korea	Kazakhstan	Nicaragua	Suriname
Armenia	Democratic Republic of the Congo	Kenya	Niger	Tajikistan
Azerbaijan	Djibouti	Kiribati	Nigeria	Thailand
Bangladesh	Dominican Republic	Kuwait	Niue	Timor-Leste
Belarus	Ecuador	Kyrgyzstan	Northern Mariana Islands	Togo
Belize	El Salvador	Lao People's Democratic Republic	Pakistan	Tokelau
Benin	Equatorial Guinea	Latvia	Palau	Trinidad and Tobago
Bhutan	Eritrea	Lesotho	Panama	Tunisia
Bolivia (Plurinational State of)	Eswatini	Liberia	Papua New Guinea	Turkmenistan
Bosnia and Herzegovina	Ethiopia	Libya	Paraguay	Tuvalu
Botswana	Fiji	Lithuania	Peru	Uganda
Brazil	French Polynesia	Madagascar	Philippines	Ukraine
Brunei Darussalam	Gabon	Malawi	Portugal	United Republic of Tanzania
Bulgaria	Gambia	Malaysia	Qatar	Uruguay
Burkina Faso	Georgia	Maldives	Republic of Korea	Uzbekistan
Burundi	Ghana	Mali	Republic of Moldova	Vanuatu
Côte d'Ivoire	Greenland	Marshall Islands	Romania	Venezuela (Bolivarian Republic of)
Cabo Verde	Guam	Mauritania	Russian Federation	Viet Nam
Cambodia	Guatemala	Mexico	Rwanda	Yemen
Cameroon	Guinea	Micronesia (Federated States of)	Sao Tome and Principe	Zambia
Central African Republic	Guinea-Bissau	Mongolia	Senegal	Zimbabwe
Chad	Guyana	Morocco	Sierra Leone	
China	Haiti	Mozambique	Singapore	
China, Hong Kong SAR			Solomon Islands	
			Somalia	

Source: World Health Organization Global Health Observatory, Tuberculosis Incidence 2018. Countries with incidence rates of ≥ 20 cases per 100,000 population. For future updates, refer to http://www.who.int/tb/country/en/.

Have you had frequent or prolonged visits* to one or more of the countries or territories listed above with a high prevalence of TB disease? (If yes, CHECK the countries or territories, above) ❑ Yes ❑ No

Have you been a resident, volunteer, and/or employee of high-risk congregate settings (e.g., correctional facilities, long-term care facilities, and homeless shelters)? ❑ Yes ❑ No

Have you been a volunteer or health care worker who served clients who are at increased risk for active TB disease? ❑ Yes ❑ No

Have you ever been a member of any of the following groups that may have an increased incidence of latent M. tuberculosis infection or active TB disease: medically underserved, low-income, or abusing drugs or alcohol? ❑ Yes ❑ No

If the answer is YES to any of the above questions, [insert your college/university name] requires that you receive TB testing as soon as possible but at least prior to the start of the subsequent semester).

If the answer to all the above questions is NO, no further testing or further action is required.

**The significance of the travel exposure should be discussed with a health care provider and evaluated.*

Part II. Clinical Assessment by Health Care Provider

Clinicians should review and verify the information in Part I. Persons answering YES to any of the questions in Part I are candidates for either Mantoux tuberculin skin test (TST) or Interferon Gamma Release Assay (IGRA), unless a previous positive test has been documented.

History of a positive TB skin test or IGRA blood test? (If yes, document below) **Yes_____ No _____**

History of BCG vaccination? (If yes, consider IGRA if possible.) **Yes_____ No _____**

1. TB Symptom Check

Does the student have signs or symptoms of active pulmonary tuberculosis disease? Yes _____No _____

If No, proceed to 2 or 3.

If yes, check below:

- ❑ Cough (especially if lasting for 3 weeks or longer) with or without sputum production
- ❑ Coughing up blood (hemoptysis)
- ❑ Chest pain
- ❑ Loss of appetite
- ❑ Unexplained weight loss
- ❑ Night sweats
- ❑ Fever

Proceed with additional evaluation to exclude active tuberculosis disease including chest x-ray (PA and lateral) and sputum evaluation as indicated.

2. Interferon Gamma Release Assay (IGRA)

Date Obtained:_____/_____/_____ (specify method) QFT-GIT T-Spot other_____
M D Y

Result: negative___ positive___ indeterminate___ borderline___ (T-Spot only)

Date Obtained: _____/_____/_____ (specify method) QFT-GIT T-Spot other_____
M D Y

Result: negative___ positive___ indeterminate___ borderline___ (T-Spot only)

3. Tuberculin Skin Test (TST)

(TST result should be recorded as actual millimeters (mm) of induration, transverse diameter; if no induration, write "0". The TST interpretation should be based on mm of induration as well as risk factors.)**

Date Given:_____/_____/_____ Date Read:_____/_____/_____
M D Y M D Y

Result: ____mm of induration **Interpretation: positive_____negative_____

Date Given:_____/_____/_____ Date Read:_____/_____/_____
M D Y M D Y

Result: ____mm of induration **Interpretation: positive_____negative_____

**Interpretation guidelines:

>5 mm is positive:

- Recent close contacts of an individual with infectious TB
- persons with fibrotic changes on a prior chest x-ray, consistent with past TB disease
- organ transplant recipients and other immunosuppressed persons (including receiving equivalent of >15 mg/d of prednisone for >1 month.)
- HIV-infected persons

>10 mm is positive:

- Foreign born or travelers to the U.S. from high prevalence areas or who resided in one for a significant* amount of time
- injection drug users
- mycobacteriology laboratory personnel
- residents, employees, or volunteers in high-risk congregate settings
- persons with medical conditions that increase the risk of progression to TB disease including silicosis, diabetes mellitus, chronic renal failure, certain types of cancer (leukemias and lymphomas, cancers of the head, neck, or lung), gastrectomy or jejunoileal bypass and weight loss of at least 10% below ideal body weight.

>15 mm is positive:

- persons with no known risk factors for TB who, except for certain testing programs required by law or regulation, would otherwise not be tested.

** The significance of the travel exposure should be discussed with a health care provider and evaluated.*

4. Chest x-ray: (Required if IGRA or TST is positive. Note: a single PA view is indicated in the absence of symptoms**)**

Date of chest x-ray: _____/_____/_____ Result: normal____ abnormal____
M D Y

Part III. Management of Positive IGRA or TST

In deciding whether to recommend treatment of LTBI to individual patients, the clinician should weigh the likelihood of infection, the likelihood of progression to active tuberculosis infection, and the benefit of therapy. Students in the following groups are at increased risk of progression from LTBI to active TB disease and should be prioritized to begin treatment as soon as possible.

- ❑ Infected with HIV
- ❑ Recently infected with *M. tuberculosis* (within the past 2 years)
- ❑ History of untreated or inadequately treated TB disease, including persons with fibrotic changes on chest radiograph consistent with prior TB disease
- ❑ Receiving immunosuppressive therapy such as tumor necrosis factor-alpha (TNF) antagonists, systemic corticosteroids equivalent to/greater than 15 mg of prednisone per day, or immunosuppressive drug therapy following organ transplantation
- ❑ Diagnosed with silicosis, diabetes mellitus, chronic renal failure, leukemia, or cancer of the head, neck, or lung
- ❑ Have had a gastrectomy or jejunoileal bypass
- ❑ Weigh less than 90% of their ideal body weight
- ❑ Cigarette and e-cigarette smokers and persons who abuse drugs and/or alcohol

END OF SAMPLE FORM

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