



# Targeted Testing for Latent Tuberculosis Infection

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## Introduction

### Purpose

Use this chapter to understand and follow national and Idaho guidelines to conduct targeted testing to screen for latent tuberculosis infection (LTBI).

In the 2005 guideline, “Controlling Tuberculosis in the United States: Recommendations from the American Thoracic Society, Centers for Disease Control and Prevention, and the Infectious Diseases Society of America,” one of the recommended strategies to achieve the goal of reduction of tuberculosis (TB) morbidity and mortality is the identification of persons other than TB contacts with LTBI at risk for progression to TB disease, and treatment of those persons with an effective drug regimen.<sup>1</sup> This was reiterated in 2016 with the U.S. Preventive Services Task Force recommendation statement on screening for LTBI in adults.<sup>2</sup>



For information on treatment, refer to Chapter 6, “Treatment of Tuberculosis Disease” and Chapter 8, “Treatment of Latent Tuberculosis Infection.”

Reducing LTBI in high-risk populations is an important strategy to control TB. With an estimated 9.5–14.7 million persons with LTBI in the U.S., continued progress toward eliminating TB in the U.S. and reducing TB among foreign-born persons requires effective strategies to meet this challenge.<sup>3</sup> Targeted testing for LTBI is a strategic component of TB control that identifies persons at high risk for developing TB who would benefit from treatment of LTBI, if detected. Persons with increased risk for developing TB include those who have had recent infection with *Mycobacterium tuberculosis* and those who have clinical conditions that are associated with an increased risk for progression of LTBI to active TB.<sup>4</sup>

### Guidance

In Idaho:

- Targeted testing for LTBI should be conducted only among persons with identified risk factors for LTBI and/or progression to TB disease.
- For a list of persons at high risk, refer to Table 1: **Persons at High Risk for Tuberculosis Infection and Progression to Tuberculosis Disease.**



## High-Risk Groups

Certain factors identify persons at high risk for tuberculosis (TB) infection and/or for progression to TB disease. Persons in the high-risk groups listed in Table 1: Persons at High Risk for Tuberculosis Infection and Progression to Tuberculosis Disease are candidates for tuberculin skin testing or interferon gamma release assay testing in Idaho. (This table can also be found in chapter 5 “Diagnosis of Tuberculosis Disease” and chapter 7 “Diagnosis of Latent Tuberculosis Infection”.)

Persons with risk factors from both columns may be at much higher risk than those with risk factors in only one column. For example, an individual born in a high-TB-prevalence country with HIV infection is at much higher risk of having active TB than a U.S.-born individual with HIV infection.



TABLE 1: PERSONS AT HIGH RISK FOR TUBERCULOSIS INFECTION AND PROGRESSION TO TUBERCULOSIS DISEASE<sup>5</sup>

For Tuberculosis (TB) Infection	For Progression to TB Disease <sup>6</sup>
<ul style="list-style-type: none"> <li>▪ High-priority contacts such as housemates or coworkers or contacts of persons who have smear-positive pulmonary or laryngeal TB</li> <li>▪ Infants, children, and adolescents exposed to adults in high-risk categories</li> <li>▪ Recent immigrants (&lt;5 years) from countries with high incidence of TB (Asian, African, Latin American, and Eastern European countries have TB rates 5–30 times higher than U.S. rates, and an increasing percentage of TB cases here are occurring among immigrants from those countries)</li> <li>▪ Recent immigrants from Mexico</li> <li>▪ Migrant workers</li> <li>▪ Persons who have recently spent over 3 months in high-incidence countries (such as missionaries from the Church of Jesus Christ of Latter-Day Saints)</li> <li>▪ Native Americans</li> <li>▪ Persons with high rates of TB transmission:               <ul style="list-style-type: none"> <li>• Homeless persons</li> <li>• Injection drug users</li> <li>• Persons with human immunodeficiency virus (HIV) infection</li> <li>• Persons living or working in institutions with individuals at risk for TB such as:                   <ul style="list-style-type: none"> <li>▪ Hospitals, especially staff in nursing, emergency departments, and laboratories</li> <li>▪ Long-term care facilities</li> <li>▪ Homeless shelters</li> <li>▪ Residences for acquired immunodeficiency syndrome (AIDS) patients</li> <li>▪ Correctional facilities</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>▪ Persons with HIV infection</li> <li>▪ Infants and children aged &lt;5 years</li> <li>▪ Persons infected with <i>Mycobacterium tuberculosis</i> within the previous 2 years</li> <li>▪ Persons with a history of untreated or inadequately treated TB disease</li> <li>▪ Persons with radiographic findings consistent with previous TB disease</li> <li>▪ Persons who use alcohol or illegal drugs (such as injection drugs or crack cocaine)</li> <li>▪ Persons with any of the following clinical conditions or other immunocompromising conditions:               <ul style="list-style-type: none"> <li>• Silicosis</li> <li>• Diabetes mellitus</li> <li>• End-stage renal disease (ESRD)/chronic renal failure, hemodialysis</li> <li>• Some hematologic disorders (e.g., leukemias and lymphomas)</li> <li>• Other malignancies (e.g., carcinoma of head, neck, or lung)</li> <li>• Body weight <math>\geq 10\%</math> below ideal body weight</li> <li>• Prolonged corticosteroid use</li> <li>• Use of other immunosuppressive treatments (e.g., prednisone or tumor necrosis factor-alpha [TNF-<math>\alpha</math>] antagonists)</li> <li>• Organ transplantation</li> <li>• Gastrectomy</li> <li>• Chronic malabsorption syndromes</li> <li>• Jejunioileal bypass</li> </ul> </li> </ul>

Source: Adapted from: CDC. Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health-care settings, 2005. MMWR 2005;54(No. RR-17):4–5; CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. MMWR 2000;49(No. RR-6):7-9.



## When to Conduct Targeted Testing

Targeted testing programs should be conducted only among groups at high risk, and testing should be discouraged for groups at low risk.<sup>7</sup> High-risk groups include persons with increased risk for developing tuberculosis (TB) and those who have clinical conditions that are associated with an increased risk for progress of latent TB infection (LTBI) to TB disease.



Factors that identify persons at high risk of LTBI infection and/or progressing to TB disease are listed in Table 1: **Persons at High Risk for Tuberculosis Infection and Progression to Tuberculosis Disease.**



Evaluate high-risk patients for LTBI as specified in Chapter 7, “Diagnosis of Latent Tuberculosis Infection.”



Offer treatment of LTBI to infected persons, irrespective of age, who are considered to be at high risk for developing active TB.<sup>8</sup> See Chapter 8, “Treatment of Latent Tuberculosis Infection.”

## Approaches to Increasing Targeted Testing and Treatment of Latent Tuberculosis Infection

The Centers for Disease Control and Prevention (CDC) describes two approaches to increasing targeted testing and treatment of LTBI.

The first approach is to promote clinic-based testing of persons who are under a clinician's care for a medical condition (e.g., HIV infection or diabetes mellitus) that also confers a risk for acquiring TB (initial exposure or reactivation). This approach depends on a person's risk profile for TB and not on the local epidemiology of the disease, and requires education of health-care providers and depends ultimately on their initiative. Although difficulties exist in quantifying and evaluating its effectiveness, this approach could conceivably become a useful tool to reduce the incidence of TB among foreign-born and other persons at high risk because they can be assessed conveniently where they receive primary health-care services.

The second approach is to establish specific programs that target a subpopulation of persons who have a high prevalence of LTBI or who are at high risk for acquiring TB disease (initial exposure or reactivation) if they have LTBI, or both. This approach presumes that the jurisdictional TB-control agency has identified pockets of high TB risk within its jurisdiction through epidemiologic analysis and profiling. Those high-risk pockets might consist of foreign-born, homeless, or HIV-infected persons, or they might be geographic regions (e.g., a neighborhood within a city or town) or specific sites (e.g., a homeless shelter or an HIV-housing facility). An epidemiologic profile should include



an assessment of the risk for TB in the population or at the site, the ease of access to the population or site, and the likelihood of acceptance of and adherence to targeted testing and treatment. For this assessment to be facilitated, populations at high risk may be separated into three tiers (see below). Assignment of groups to these three tiers is based on six criteria: 1) incidence of TB; 2) prevalence of LTBI; 3) risk for acquiring TB disease if the person is infected with *M. tuberculosis*; 4) likelihood of accepting treatment for LTBI and adhering to it; 5) ease of access to the population; and 6) in a congregate setting, the consequence of transmission of *M. tuberculosis*.

**BOX 6. Priority population subpopulations and sites for targeted testing and treatment of latent tuberculosis (TB) infection**

**Tier 1**

- Persons working in or served by clinics or community health organizations providing care to HIV-infected persons
- Prisoners
- Legal immigrants and refugees with Class B1 and B2 TB notification status
- Recently-arrived refugees
- Other well-defined groups in congregate living facilities
- Persons enrolled in substance abuse treatment programs\*

**Tier 2**

- Jail detainees
- Persons working or living in homeless shelters
- Immigrants reporting for adjustment of status

**Tier 3**

- Other foreign-born persons at high risk (i.e., those that immigrated  $\leq 5$  years from countries with a high incidence of TB)

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\* Persons enrolled in substance abuse treatment programs should be considered a transition group between Tier 1 and Tier 2, depending on the local epidemiology of tuberculosis.

Found at: <https://www.cdc.gov/mmwr/PDF/rr/rr5412.pdf>



For information on the system for prioritizing persons for targeted testing, refer to “Controlling Tuberculosis in the United States: Recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America” (MMWR 2005;54[No. RR-12]:40–42) at this hyperlink: <http://www.cdc.gov/mmwr/PDF/rr/rr5412.pdf>.



For assistance planning targeted testing, contact the Idaho TB Program at 208-334-5939.

## Screening for Latent Tuberculosis Infection in Facilities

Screening for LTBI should be conducted based upon each facility's risk for transmission of *Mycobacterium tuberculosis* (i.e., low-risk, medium-risk, or potential for ongoing transmission)<sup>9</sup> as determined in its TB risk assessment (both initial baseline assessment and periodic reassessments).



Risk assessment protocols and elements are outlined in the CDC's “Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-care Settings, 2005” (MMWR 2005;54[No. RR-17]) at this hyperlink: <http://www.cdc.gov/mmwr/pdf/rr/rr5417.pdf>.



Infection control planning for facilities will be discussed in Chapter 16, “Infection Control.”

Screening determines if a person should be evaluated for LTBI or TB disease by asking questions to gather information about whether the person has signs or symptoms of TB disease, belongs to a group at high risk for LTBI or (if infected) for progression to TB disease, or has a prior positive tuberculin skin test (TST).



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## References

- <sup>1</sup> ATS, CDC, IDSA. Controlling tuberculosis in the United States: Recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America. *MMWR* 2005;54 (No. RR-12):15.
- <sup>2</sup> US Preventive Services Task Force. Screening for latent tuberculosis infection in adults, US Preventive Services Task Force recommendation statement. *JAMA* 2016; 316(9):962-969. Doi:10.1001/jama.2016.11046
- <sup>3</sup> ATS, CDC, IDSA. Controlling tuberculosis in the United States: Recommendations from the American Thoracic Society, CDC, and the Infectious Diseases Society of America. *MMWR* 2005;54(No. RR-12):40.
- <sup>4</sup> CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR* 2000;49(No. RR-6):1.
- <sup>5</sup> CDC. Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health-care settings, 2005. *MMWR* 2005;54(No. RR-17):4–5; CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR* 2000;49(No. RR-6):7–9, 22.
- <sup>6</sup> CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR* 2000;49(No. RR-6):8–9.
- <sup>7</sup> CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR* 2000;49(No. RR-6):1-2.
- <sup>8</sup> CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR* 2000;49(No. RR-6):1.
- <sup>9</sup> CDC. Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health-care settings, 2005. *MMWR* 2005;54(No. RR-17):10.