

GUIDELINES FOR ADULT TUBERCULOSIS TESTING AND FOLLOW-UP IN CALIFORNIA:

Information for Primary Care Medical Providers, to Comply with AB 2132

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1. Is tuberculosis still a problem in California?

TB disease is diagnosed in more than 2000 Californians each year [1]. TB disease is a serious illness; half of patients are hospitalized and in 2023, 13% of people with active TB died [1, 2]. The TB incidence rate in California's is about twice the national average [1]. Active TB disease requires effective treatment with several medications over several months in addition to isolation of patients until they are non-infectious, and tracing of contacts. More than 2 million Californians are infected with TB and an estimated five percent of people with LTBI will progress to having active TB disease. More than 80% of people with active TB in California could have had their disease prevented through testing and treatment of latent TB infection (LTBI) before it progressed to active disease [1].

2. What does California law require of primary care providers?

California Assembly Bill 2132 (effective January 2025) requires clinics and medical offices that provide primary care to offer a tuberculosis (TB) screening test to all patients age 18 and over in high-risk groups [3]. These groups and proper testing techniques are not defined in the bill but are described below (*see Section 4-6*). The bill requires appropriate follow-up for those testing positive for TB infection. This follow-up is also not defined by the bill but is described step by step below (*see Sections 7-9*). It should include distinguishing the many patients with latent TB infection (LTBI) from a few who may already have active TB disease, and appropriate treatment for LTBI (*as will be described in Sections 8-9*) or referral.

3. What is the Difference between Latent Tuberculosis Infection (LTBI) and Active Tuberculosis Disease, and Why is it Important to Distinguish them?

Individuals with LTBI are asymptomatic and have positive TB screening tests, but chest x-rays (CXR) without evidence of TB disease. People with LTBI are not contagious. LTBI can progress into TB disease at any time in a person's life if it remains untreated.

Active TB disease occurs when the tuberculosis mycobacteria are proliferating and the patient develops clinical signs or symptoms or imaging findings consistent with progressive disease. Patients with active TB disease should be considered contagious unless proven otherwise, especially when the tuberculosis is present in their lungs or larynx. TB disease can affect any organ system, but most commonly affects the lungs and can be spread through airborne particles from one person to another. Active TB disease requires more intensive treatment than LTBI, and monitoring by public health staff.

Three major public health strategies for control and prevention of TB are detection and treatment of LTBI to prevent cases of active disease, early diagnosis, isolation, treatment of persons who already have active TB, and tracing, testing, and treating the contacts of those persons with active TB before further transmission can occur [4]. AB 2132 mainly aims at increasing the former, but may lead to earlier recognition of some cases of active disease as well and to tracing of their contacts.

4. Who Should be Screened for TB?

The groups of Californians shown below are at increased risk for TB exposure or at increased risk for progression of LTBI to TB disease[4], and should be considered as the populations for whom AB 2132 requires TB testing. Routine testing of people without risk factors is not recommended, because they may result in a higher percentage of false positive results and unnecessary evaluations and treatment. Providers should check local TB control programs for local recommendations; a directory is available on the California Tuberculosis Controllers Association website [5]

- a. **Birth, travel, or residence for at least 1 month, or frequent border crossing in a country with an elevated TB rate.** Countries outside of the United States other than Canada, Australia, New Zealand, and those in western and northern Europe are all considered to have elevated TB rates. Among common sources of travel and immigration, Vietnam and India have especially high rates.
- b. **Immunosuppression**, e.g., HIV infection, organ transplant recipient, or current or planned treatment with biologic agents including TNF-alpha antagonist (e.g., infliximab, adalimumab, etanercept, others), steroids (equivalent of prednisone ≥ 15 mg/day for ≥ 1 month), or other immunosuppressive medication or condition.
- c. **Close Contact** (e.g., residential, occupational, or recreational) to someone with infectious TB disease during lifetime.
- d. **Homelessness or incarceration**, current or past.

A good general guide to TB testing and LTBI has been provided by the National Society for Tuberculosis Clinicians (NSTC) and endorsed by the National Tuberculosis Coalition of America (NTCA), the California Department of Public Health and TB Controllers, and others. That guide may be referred to as a reference for many statements in this document that lack other references [6].

5. What Patients are Exempted from Mandatory Screening under AB 2132?

- a. Testing not indicated: Have had a previous documented negative TB screening test and no new risk factors or symptoms suggestive of active TB disease since then.
- b. Testing not indicated: If **previous documented positive TB screening test**, the patient is exempted from retesting, but not from evaluation of symptoms, and from workup if present, especially if never treated for LTBI. (See Section 7 below.)
- c. Exemption in bill: Lack of insurance to cover TB screening and follow-up. (However, public health may be able to provide these services free. This group may include high-risk individuals.)
- d. Exemption in bill: Being treated for a life-threatening emergency. (However, screen after emergency is over if risk factors are present.)
- e. Exemption in bill: Lack of capacity to consent, and there is no available conservator who can consent for them. (However, continue efforts to contact parent or guardian for consent.)
- f. Exemption in bill: Minors (under 18) are not included in the bill requirements, but should be screened also if risk factors are present, and if consent of parent or guardian can be obtained. School outbreaks have occurred. Minors with LTBI have very low risk of hepatotoxicity from treatment, which may provide lifetime protection from active TB and is cost-effective.

The bill does not supersede existing separate requirements for TB testing regardless of risk for hiring of health care workers. Follow-up of positive tests should be the same for such testing. (See Section 7 below.), except that if a worker with no known risk tests positive, a repeat test may be done to confirm that it is not a false positive [6].

6. What Tests should be Used for to Screen for TB Infection, and How Should They Be Done?

The options for TB testing are a blood test or a skin test.

- a. **The blood test is referred to as IGRA** (interferon-gamma release assay). **IGRAs are considered to be the preferred tests for all patients. They are especially important for persons born outside of the United States.** TB skin tests can cross-react and can be falsely positive in patients without LTBI, but who instead were previously vaccinated with the Bacillus Calmette-Guérin vaccine (BCG). BCG is routinely given to young children in most countries outside of the United States, and is often not documented. (False positive TST results are less likely with distant BCG vaccination, but can still occur.) IGRAs additionally do not cross-react with atypical mycobacteria, some of which can also cause false positive TB skin tests. Another advantage of the IGRA test is that laboratories report positives to public health, permitting surveillance that can monitor trends.

Two brands are currently available: Quanti-FERON-TB Gold Plus (QFT-Plus) and T-Spot TB test. Both are drawn from venous blood and **kept at room temperature [7]. Same-day delivery** to the lab is important. Only one visit is usually needed for a determination. However, indeterminate or borderline results (up to 4%) may be repeated after one week. If still not diagnostic, a later IGRA or a TB skin test may be performed.

- b. The **skin test** is known by several names, TST (tuberculin skin test), PPD (purified protein derivative), or Mantoux. It has been used since the 1930s. Two brands are currently available, Aplisol and Tubersol. Skin testing is still an approved TB screening method, but have several disadvantages. Sensitivity and specificity are usually lower than with the IGRA, false positives are experienced from BCG vaccine or some atypical Mycobacteria, at least two visits are required, and both application and reading are technically demanding. (CDC in 2016 recommended skin testing < age 5 because of limited IGRA experience in young children at that time [6], but newer guidelines suggest IGRA for all ages.) A tuberculin (not insulin) 1 ml syringe with a 27 gauge beveled needle is used to inject 0.1 ml (5 units) of PPD-S solution intradermally into the inner forearm, with the bevel facing up. Two helpful online guides are provided as useful references [8, 9].

Interpretation of skin test results: Induration (not erythema) is measured at 48-72 hours. In California, anyone with 10 mm of induration is considered positive. Five mm is considered positive if the patient has suspected exposure within the past 8-10 weeks, HIV or other condition or medication that can reduce immunity (see Section 4 above), or X-ray finding such as fibrosis consistent with old, inactive TB (see Section 7 below). If TB infection is suspected but induration is absent or insufficient for a positive diagnosis, the skin test immune response may be “boosted” with a “second step” test (requiring another two visits), given 7-25 days after the first, and read at 48-72 hours, or more simply, an IGRA test may be performed.

Both tests rely on a delayed hypersensitivity reaction that takes time to develop after infection, so either test can be falsely negative if obtained soon after exposure to TB. Therefore, for people with known recent exposure to TB or recent travel to a high rate of TB, wait at least 8 weeks after exposure or return from the high risk area before obtaining a TB screening test.

Re-testing should predominantly occur among persons with previous negative test results and a new risk factor, potential exposure, or symptoms since the last TB screening test.

7. How to Evaluate Patients with Positive TB Screening Tests (IGRA or TST), and to Differentiate LTBI from Active Tuberculosis?

Most people who are healthy and have a positive TB screening test have LTBI. However, there is a continuum between LTBI and active TB disease, making it important to evaluate if the patient might have early or subclinical TB disease before treating LTBI. ***Depending on symptoms, x-ray findings, and sputum results if indicated, this section can be the most clinically demanding.*** A useful, printable flowsheet for clinicians can be found on the California Department of Public Health Website (see *first printable resource below*).

a. Symptoms and Signs of TB disease:

All patients being tested for TB, all who test positive, and any with a history of a previous positive test (especially if never treated for LTBI) should be asked about symptoms suggestive of active TB disease. Multiple symptoms increase the suspicion of active TB disease including:

- Cough for more than 2-3 weeks, usually producing sputum
- Persistent fevers
- Chills
- Night sweats
- Hemoptysis (coughing up blood, usually more than tiny flecks)
- Weight loss (unintentional), loss of appetite
- Chest pain (non-cardiac)
- Fatigue accompanying one or more of the other symptoms

Extra-pulmonary TB (in organs besides the lungs) may cause other symptoms such as enlarged lymph nodes, hematuria, or meningitis.

Physical exam should be done if symptoms are present, using masks and PPE, or if asymptomatic but known untreated LTBI (masks and PPE are not needed for the latter). Include at least vital signs, oropharynx, neck, lungs, lymph nodes, abdomen, and any organ with suspected extra-pulmonary TB.

If the patient has been coughing for ≥ 2 -3 weeks (especially if it is productive), unexplained by another diagnosis, order a chest x-ray (and TB screening test if not already done) as well as sputum tests. (See 7.b and c below.) If suspicion of active TB because of history, other symptoms, or physical findings, consider collecting initial sputum immediately, and sending the patient with a mask on (as with COVID) for CXR, immediately or as soon as possible.

b. Chest x-ray (CXR):

CXR should be ordered for everyone with a positive TB screening test result that is new, and for anyone with a past positive test who has not been treated for LTBI and is symptomatic or now being considered for treatment, unless a recent negative CXR (within last three months) is available for review. The AP view is the most valuable for diagnosis.

- CXR suggesting active TB, even without symptoms, requires prompt sputum testing for TB disease and reporting to your local public health department. (See Section 9.)
- CXR suggesting old, inactive TB, such as fibrosis or calcified nodules, with no documented adequate treatment, may also be an indication for sputum testing if patient is symptomatic has positive physical findings, or is being considered for LTBI treatment. X-ray comparison or consultation may be necessary. If sputum testing is negative, treat for LTBI (see below). If patient is asymptomatic but sputum has been submitted and is pending, wait for sputum culture results before starting treatment because LTBI

treatment is inadequate for active TB disease.

c. Sputum testing:

Indications have been discussed above (see 7.a and b). (Children, who are not dealt with in AB 2132, rarely produce sputum and may require gastric aspiration [10].)

Obtain 3 sputum specimens on separate days, at least one of which is collected in the early morning, to increase yield. To avoid infectious aerosols from forced coughing endangering patients and staff in a medical facility, safe techniques are to collect sputum outdoors, while leaning out of an open window, or in a room with negative air pressure or HEPA filtration, or in a lab hood.

Simple instructions for patients on how to collect good quality sputum samples is available in multiple languages through the Minnesota Department of Public Health [13]. Sputum samples should be sent for the following tests:

- Acid-fast bacilli (AFB) smear: Unchanged since 1880s; can do rapidly, visualizes bacilli, but does not differentiate TB from atypical mycobacteria (false positives), and many false negative results.
- AFB culture: The gold standard, and is required for antimicrobial sensitivity testing, but can take 1-2 months for results.
- Nucleic acid amplification test (NAAT): NAAT is a major advance in terms of rapid and specific diagnosis.: The Xpert® MTB/RIF assay can be run by a lab within 2 hours, identifies TB bacilli, and distinguishes them from atypical mycobacteria. In addition to diagnosing TB, it also predicts whether there is resistance to rifampin. Rifampin resistance on Xpert is suggestive of multi-drug-resistant tuberculosis (MDR-TB), and a public health or infectious disease specialist should guide treatment.
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- d. Suspected extra-pulmonary TB may require mycobacterial tests on substances from various tissues, depending on the affected organ system. However, sputum testing is still performed for patients with extra-pulmonary TB as it helps determine a patient's risk of infectiousness.

Clinical judgement is needed in suspecting active TB, because if infection is very recent (past 8 weeks) or immune function is deficient, active TB disease might be present despite a negative screening test and even a negative appearing CXR. Note also that some patients might develop active TB disease despite past treatment for inactive/latent infection.

8. How to Treat Latent Tuberculosis Infection (LTBI)?

Once active TB disease has been ruled out, treatment for LTBI should begin. **Public health departments increasingly encourage primary care providers to treat LTBI**, but it may be referred to a local public health clinic if one exists conveniently and provides this service. Referral to an infectious disease specialist may not be cost-effective. Three or four-month regimens that include rifamycins (rifampin or rifapentine) for treating LTBI have been shown to be as effective as 9 months of isoniazid, more likely to be completed, and less hepatotoxic. Use of these shorter regimens is preferred for most patients. A drug interaction guide for rifamycins is available from the Curry Center/UCSF [11]. LTBI treatment options for adults include the following:

- a. **Rifampin** 10mg/kg/day (max 600mg daily) for 4 months
- b. **Isoniazid and Rifapentine (3HP)** weekly for 12 weeks (this regimen is often favored for its simplicity, but not in pregnancy as it has not been tested for safety in pregnant women)
 - INH 900mg weekly
 - Rifapentine 900mg weekly

- Add pyridoxine 50mg weekly
- c. **Isoniazid and Rifampin** daily for 3 months
 - Isoniazid 5mg/kg/day (max 300mg)
 - Rifampin 10mg/kg/day (max 600mg)
 - Add 25mg pyridoxine daily for most patients or 50mg daily if patient has neuropathy
- d. **Isoniazid** 5mg/kg/day (300mg max) for 6-9 months
 - Add 25mg pyridoxine daily for most patients or 50mg daily if patient has neuropathy

9. What Monitoring is Needed during LTBI Treatment, and What Results are Contraindications to Treatment?

TB medications can be hepatotoxic, and is moreso for INH than for rifamycins [12]. Baseline liver function testing (LFTs) are needed prior to starting LTBI treatment for the following medical conditions:

- a. **Age >50 years** (hepatotoxicity including drug-induced hepatitis increases with age.)
- b. Pregnant, or postpartum <3 months
- c. HIV infection
- d. Liver disease (including cirrhosis, non-alcoholic fatty liver disease, chronic hepatitis B/C)
- e. Heavy alcohol use
- f. Use of other hepatotoxic medications

If baseline ALT is normal, proceed with LTBI treatment; routine LFT testing during treatment is not needed. However, ***during treatment, all patients should be monitored at least monthly for symptoms of liver toxicity (anorexia, fatigue, abdominal pain, or jaundice); if these develop, hold treatment and evaluate for acute or exacerbated hepatitis.***

If baseline ALT is elevated <3x upper limit of normal (ULN), consider LTBI treatment with monthly LFT monitoring and use rifampin in preference to isoniazid-containing regimens.

ALT >3x ULN is a relative contraindication to treatment [6]. If believed to be due to chronic hepatitis, or if baseline hepatitis symptoms, ***hold treatment***. If not believed to be due to chronic hepatitis and no symptoms, treatment may be considered with very close monitoring if benefits are judged to exceed risks. Consider consulting a liver specialist.

If baseline ALT is elevated >5x upper limit of normal, hold treatment.

10. How is Active TB Disease Managed, and How Can Primary Care Providers Help?

Because of the risks of complications, drug resistance, and mortality, and the complexities of coordinating treatment with public health measures, a primary care provider (PCP) who has not had experience treating TB should generally refer treatment to the local public health department or an Infectious Disease specialist (this is especially important for MDR-TB). However, if these services are not conveniently and promptly available, treatment may be provided or initiated by the PCP with consultation.

- a. ***Report probable active TB disease immediately to local public health department [5] if not already done. (Title 17 regulations require reporting within 24 hours.)***
- b. ***Isolation precautions*** should be instituted and continued until AFB smears from specimens on 3 separate mornings have been negative and after at least 2 weeks of treatment [14, 15].. ***The PCP should work with patient and family to support implementation of precautions recommended by local public health.*** These typically include:
 - If hospitalization is needed, patient should be in isolation room, with negative pressure.
 - If at home, the patient should sleep alone, cancel outside engagements, avoid family members (who will need TB screening), wash hands frequently, use fan and open windows.

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- Wear a mask (as for COVID) if absolutely necessary to be indoors where others are present, and stay as far apart as possible. Avoid public transportation.
- Attend medical appointments wearing a mask, avoiding waiting rooms, and treating staff should also mask.
- Outdoor exercise without a mask is generally safe if over 6 feet from other people, especially in sunlight or a breeze.)
- c. **Contact tracing**, to identify individuals who may have been exposed and should be tested and considered for prophylactic treatment, is a public health function. However, the PCP can assist by informing public health staff of persons known to the provider to have been in close contact (including clinical staff).
- d. **Starting treatment regimen** generally includes four drugs for two months, usually **isoniazid, rifampin, ethambutol, and pyrazinamide**, then two drugs to which the cultures show no resistance (usually INH and rifampin unless MDR-TB) for 4-7 months as determined by public health or I.D. specialist. Dosage is daily or 3 times/week. Directly observed swallowing of pills (DOT) is routinely recommended; and can be done by smartphone.[16]. As with LTBI, pyridoxine supplementation is recommended with INH (see *Section 8*). Lab monitoring is needed for drug toxicity screening (see *Section 5*) and to monitor sputum response to treatment.

Cited References

1. California Department of Public Health, *Tuberculosis in California, 2025 Snapshot*:
<https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/TB-in-California-2025-Snapshot.aspx>
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6. National Society of Tuberculosis Clinicians, *Testing and Treatment of Latent Tuberculosis Infection in the United States, February 2025*:
https://tbcontrollers.org/docs/NSTC/LTBI_Clinical_Guide_Feb2025_FINAL.pdf
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<https://www2c.cdc.gov/podcasts/media/pdf/mantouxtranscript.pdf>
9. McGill University International TB Training Centre, *Training slides for tuberculin skin testing (TST)*:
https://www.mcgill.ca/tb/files/tb/tuberculin_skin_testing_tst_technique_training_feb202018_english.pdf
10. CDC, *Tuberculosis clinical care for children*, <https://www.cdc.gov/tb/hcp/clinical-care/children.html>
11. Curry TB Center/UCSF, *Rifamycins drug-drug interactions*,

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<https://www.currytbcenter.ucsf.edu/products/rifamycin-drugdrug-interactions-a-guide-for-primary-care-providers-treating-latent-tuberculosis>

12. US Preventive Services Task Force, *Latent tuberculosis in adults: screening*:
<https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/latent-tuberculosis-infection-screening>
13. Minnesota Department of Public Health, Instructions for collecting sputum for TB:
<https://www.health.state.mn.us/diseases/tb/basics/factsheets/sputum.html>
14. Curry TB Center/UCSF, *Tuberculosis infection control, 2007*:
<https://www.currytbcenter.ucsf.edu/products/tuberculosis-infection-control-practical-manual-preventing-tb>
15. Healthline, *A guide to tuberculosis isolation precautions*:
<https://www.healthline.com/health/tuberculosis-isolation-precautions>
16. CDC, TB 101 for health care workers: *directly observed therapy*:
<https://www.cdc.gov/tb/webcourses/TB101/page16489.html>

Additional Resources

Printable resources:

- California Department of Public Health, *Prevent tuberculosis (TB) in four steps, April 2024*:
<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CA-TB-Prevent-TB-in-4-Steps.pdf>.
- California Adult Risk Assessment:
<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CA-Adult-TB-Risk-Assessment.pdf>
- Prevent TB in Four Steps: One Page Guide to LTBI for Clinicians.
<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/CA-TB-Prevent-TB-in-4-Steps.pdf>
- Script for talking to adult patients about LTBI
<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/Provider-Script-LTBI-Counseling-Adults.pdf>
- Waiting room posters and brochures in multiple languages:
https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/TB_Community_Resources.aspx
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Video resources:

- Physician-patient messaging videos model how to discuss TB risk and LTBI testing with patients
 - Why do I need treatment for LTBI?
<https://www.youtube.com/watch?v=jkuaLuPix44>
 - Why should I get tested for LTBI?
https://www.youtube.com/watch?v=rBNmpBlwZ_Q
 - I received the BCG vaccine, do I still need LTBI testing and treatment?
<https://www.youtube.com/watch?v=2GA0xi5MIYU>
- TB educational Videos
https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/TB_Community_Resources.aspx
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