

Tuberculosis Screening in Children: Information for Massachusetts School Nurses

Guidance from the Massachusetts Department of Public Health (DPH) on the risk-based approach to screening for TB, methods of testing for TB infection, and the symptoms of active TB disease.

Tuberculosis (TB) is an airborne infectious disease caused by *Mycobacterium tuberculosis*. Screening can identify children at increased risk for TB infection, and who may benefit from TB testing. Treatment is available to reduce the risk of developing active TB, and medications are available to cure TB disease.

TB Risk Assessment and Testing

Summary

- DPH recommends that school-aged children in Massachusetts public or private schools should have a [Pediatric Tuberculosis Risk Assessment](#) completed and documented on the school health form.
- The Pediatric TB Risk Assessment may be performed by school nurses, primary care providers, pediatric clinics, or local public health nurses.
- Children who are at risk of exposure to TB should be tested for TB infection using either the Mantoux tuberculin skin test (TST) or interferon-gamma release assay (IGRA). IGRAs are preferred over TSTs for persons 2 years of age or older with a history of BCG vaccination.
- Children with positive TST or IGRA results should receive a TB symptom screen and be referred for medical evaluation.
- Symptoms that should prompt urgent medical evaluation include unexplained cough for more than 2-3 weeks, fevers, night sweats, weight loss or failure to gain weight, lymphadenopathy, or excessive fatigue.
- Asymptomatic children with positive TSTs or IGRAs and pending chest X-ray results should not be excluded from school but should complete a medical evaluation as soon as possible and preferably within 90 days.

Process

1. Conduct Pediatric TB Risk Assessment to determine need for further testing

The Massachusetts Pediatric TB Risk Assessment is used to identify children for whom TB infection testing is recommended based on either the risk of TB infection or the risk of progression to TB disease if infected:

- Birth or residency in, or non-tourist travel greater than one month in duration to, any country other than the United States, Canada, Australia, New Zealand, or a country in western or northern Europe
- Known contact to someone sick with infectious TB disease during the child's lifetime
- History of immunosuppressive disease or use of medications that might cause immunosuppression, as delineated in the [Pediatric TB Risk Assessment](#)

If a risk is identified, a test of TB infection is recommended. Children with no risk factors for either TB infection or progression to TB disease should not be tested. Repeat testing is not recommended in the absence of new risk factors or new symptoms suggestive of TB disease since the last negative test.

2. Test for TB Infection: Interferon-Gamma Release Assay (IGRA) or Tuberculin Skin Test (TST)

The TST is an acceptable test for all ages when administered and read correctly.

- Standardized test of delayed hypersensitivity
- Prior BCG vaccination may increase risk for false positive TST results
- Uses the Mantoux method: Intradermal injection of 5TU of purified protein derivative (PPD) by a trained provider, usually on a forearm
- Response to antigen contained in the PPD is measured in millimeters of induration (not redness) across the transverse aspect of the forearm
- Induration must be measured by a trained health care worker 48-72 hours after placement
- Positive TST results should be [reported](#) to DPH

Interpreting TST results

Definition of positive TST in infants, children, and adolescents:

Induration ≥ 5 mm	Induration ≥ 10 mm	Induration ≥ 15 mm*
• Close contact with known or suspected case of TB • Child suspected to have active TB • Child receiving immunosuppressive therapy or with immunosuppressive conditions including HIV	• Child at risk for TB disease due to young age (<4 years) or other co-morbid conditions including diabetes, malnutrition, lymphoma, chronic renal failure • Child with increased risk of exposure (per risk assessment)	• Child 5 years of age or older without any risk factors *Children without risk factors for TB infection or progression to TB disease generally would not require TB testing

IGRAs are appropriate tests for children 2 years of age and older.

- Blood test; whole blood is mixed with antigens and analyzed in a laboratory
- Approved tests include QuantiFERON-TB Gold Plus and T-SPOT.TB
- Test results are not affected by prior BCG vaccination
- Positive IGRA results should be [reported](#) to DPH
- IGRA results may be reported from the laboratory as positive, negative, borderline, or indeterminate
- Indeterminate are not negative and should be repeated

3. Evaluation of children and adolescents with a positive TST or IGRA

Children with positive TST or IGRA results should receive a TB symptom screen and be referred for medical evaluation. Symptoms that should prompt urgent medical evaluation include unexplained cough for more than 2-3 weeks, fevers, night sweats, weight loss or failure to gain weight, lymphadenopathy, or excessive fatigue.

Asymptomatic children with a positive TST or IGRA and pending chest X-ray results should not be excluded from school but a referral for medical evaluation should be made as soon as possible. School nurses can help track these TB clinic appointments and may assist parents/guardians with scheduling or keeping a TB clinic appointment.

Medical evaluation should include:

- Health history and physical examination
- Review of systems, including screening for symptoms of active TB disease
- Chest radiograph
- If indicated, sputum AFB smears, cultures, and nucleic acid amplification testing (NAAT)

Children with no signs or symptoms of active TB disease and with a normal chest radiograph are candidates for treatment of latent TB infection (LTBI). Treatment of LTBI, although not mandated, should be strongly recommended. School-based directly observed preventive therapy (DOPT) programs can be highly effective in achieving treatment completion in children.

4. Special considerations

Immunizations:

- **Live virus vaccination:** Testing for TB infection with one of the immune-based methods, either the tuberculin skin test (TST) or an interferon gamma release assay (IGRA), should be done before administration of an injectable live virus vaccine if possible. This includes the JYNNEOS vaccine for the

prevention of smallpox and mpox disease. The Centers for Disease Control and Prevention (CDC) recommends that if administration of a live virus vaccine has already occurred, to consider deferring TST or IGRA until 4-6 weeks after vaccination.

- **Covid-19 mRNA vaccination:** As of August 31, 2021, the CDC no longer recommends delaying tests of TB infection following COVID-19 mRNA vaccination. Data are currently limited regarding the interaction of mRNA vaccines and tests of TB infection, and there may still exist circumstances in which the timing of COVID-19 vaccination in relation to TB testing should be considered. Given that the effect of mRNA vaccines on tests of TB infection are uncertain and in order to avoid possible confounding of test results by the systemic immune response to mRNA vaccination, DPH recommends administering the vaccine at least 4-6 weeks prior to, or at the time of TST reading or IGRA draw, if possible.
- **BCG vaccination:** A history of bacille Calmette-Guerin (BCG) vaccine is not a contra-indication for testing for TB. BCG vaccine is not part of the vaccine schedule in the U.S. but is used extensively throughout the world. BCG does not provide lifelong immunity and its effectiveness wanes over time. If a child is at risk for TB, a test of TB infection should be performed regardless of BCG vaccine history. IGRAs can distinguish between TB infection and BCG and are recommended in children 2 years of age or older who have a history of BCG vaccination.

Resources:

- Division of Global Populations and Infectious Disease Prevention, Bureau of Infectious Disease and Laboratory Sciences, DPH telephone: 617-983-6970, mass.gov/Tuberculosis; [Report TB](https://mass.gov/Report-TB): 617-983-6800
- Contact information for healthcare facilities in Massachusetts that provide state-supported TB diagnostic and treatment services: [Massachusetts TB Outpatient Services](#)
- [Information on Tuberculosis for Patients and Families in English and 23 other languages](#)
- [Massachusetts Pediatric Tuberculosis Risk Assessment Form](#)
- [Massachusetts Pediatric Tuberculosis Risk Assessment User Guide](#)
- [Overview from the Massachusetts Department of Elementary and Secondary Education on Welcoming Newcomer and Refugee Students and Families](#)