Boston Medical Center Maternity Care Guideline
Guideline: Screening for Latent Tuberculosis Infection (LTBI) in Pregnancy
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Introduction

- **Definition:** To test for LTBI according to national, state and local public health guidelines in the pregnant population at Boston Medical Center.

- **Prevalence**: Approximately one-third of the world's population is infected with M. tuberculosis. It is estimated that more than 11 million people in the United States have LTBI, which is about 4% of the total population. While not everyone with LTBI will develop TB disease, about 5 – 10% of infected people will develop TB disease if not treated. This equates to approximately 550,000 to 1,100,000 people who will develop TB at some point in their life, unless they receive adequate treatment for LTBI.[1]

  For those individuals diagnosed with LTBI there is a 5-50% lifetime risk of developing active disease, and a 5-10% risk per year for immunocompromised individuals.[2]Active TB disease rarely is discovered in asymptomatic persons by tuberculin skin testing. Finding LTBI provides an opportunity to treat and prevent reactivation of the latent infection that leads to active disease. Studies have shown that treatment of LTBI can prevent reactivation TB with an efficacy of 60%-90%. Because of the relatively low TB prevalence in the US, and with reactivation tuberculosis representing a large proportion of new cases, treatment of LTBI is considered an important public health strategy to achieve national TB elimination.[2]

  Brief significance in pregnancy: Evidence has shown that pregnancy does not increase the risks of progression or activation of either TB or LTBI. However, pregnancy is an essential time for screening due to her engagement with the health care system, and the frequency of visits

Diagnosis

- **All pregnant women should be screened in the first trimester for their risk status. Only women with risk factors should be tested.**

<u>Risk Factors to determine who needs to be tested: Who is High Risk?</u>

- **Persons from countries with prevalence >25/100,000 should be tested at BMC. For TB prevalence rates by country visit: http://www.who.int/tb/country/data/profiles/en/**
- Symptomatic for TB disease (fever, night sweats, cough, and weight loss)
- Close contact with someone with active TB
- Foreign-born from or >1month travel to high prevalence country
- Resident of large congregate shelter (NOT small family shelters), recent incarceration without testing, or health care workers in these or other high risk settings
- Persons with clinical conditions associated with progression to active TB

    - HIV infection, silicosis, diabetes, chronic renal failure/hemodialysis, gastrectomy, jejunoileal bypass, solid organ transplant [renal, cardiac], carcinoma of the head and neck, being more than 15% underweight and who also are likely to have been exposed to TB
- Active IV drug use
- CXR with fibrotic changes suggestive of prior TB infection
- Prior TB can have a variety of nonspecific appearances; however, radiographically dense, upper lobe linear or nodular changes are characteristic**.** Hilar, lower lobe, and pleural densities are also seen, but are less specific for TB. Apical pleural thickening without parenchymal scarring is specifically NOT associated with TB.
- Significant laboratory studies and table with norms in pregnancy
- Significant ultrasound findings
- Physical exam and significant findings
- Recommended evidence based **algorithm** or pathway for diagnosis (citation required)

Tuberculosis Skin Test (TST or PPD): Gold standard for TB screening in the United States and the endorsed method of screening at BMC.

- **Place 0.1ml PPD** intradermal, not subcutaneous, on the ventral surface of the forearm.
- **Read test in 48-72 hours**. **Measure induration ONLY, in millimeters, across, i.e. perpendicular to, the long axis of the arm. Do not measure redness without induration.**
- If the patient does not return until after 72 hours and the test appears negative, it should be replanted. If positive after 72hours, the test is positive and need not be repeated.
- **NEGATIVE no further testing indicated.**
- **POSITIVE obtain CXR as soon as possible**
    - **See Appendix 1 for definition of Positive**
    - **If positive perform chest x-ray**:
        - Because TB disease is dangerous to both mother and fetus, pregnant women who have a positive PPD result or who are suspected of having TB disease, as indicated by symptoms or other concerns, should receive CXR with shielding consistent with safety guidelines as soon as feasible, even during the first trimester of pregnancy.
        - If the woman is symptomatic for active disease such as fever, weight loss or coughing and if no CXR result is available before delivery, then mother and baby may need to be separated. Medical staff will make such a determination based on their assessment that the mother's condition requires her to be in an isolation room until a CXR result is obtained.

Quantiferon Gold:

- Blood test for TB screening. This is the standard testing for TB at EBNHC.
- The MA DPH and the BMC TB clinic prefer TST testing for best accuracy.
- Quantiferon Gold is associated with more false negative results than TST testing, is more expensive, and takes longer to result.
- Quantiferon Gold has less reliability and more variability in test results in the same individual, ie. a patient may test positive at one time and subsequently test negative.

- Quantiferon Gold testing may be considered when patient is absolutely unable to return to clinic for TST reading or if she has received a BCG booster after early childhood (see www.bcgatlas.org for countries where BCG is given beyond infancy).

    - **Negative results:** No further follow up.
    - **Positive results**: patients should have CXR and be scheduled at TB clinic postpartum
    - **Indeterminate results:** patients should be offered TST skin test. If positive result refer for CXR and TB clinic postpartum. If negative no further testing indicated.

Treatment/Management

- **Pregnant women diagnosed with LTBI or TB should be referred to Boston Public Health Commission for TB visit during the pregnancy.**
- **Currently recommended treatments[1]**
    - Isoniazid (INH) Regimen: 9months or 6months. Supplementation with Vitamin B6 in pregnancy. The 9 month INH regimen is considered the most efficacious. (CDC http://www.cdc.gov/tb/publications/LTBI/treatment.htm)
    - Rifampin (RIF) Regimen: 4months for those who cannot tolerate INH or who have been exposed to INH-resistant TB. Not recommended for HIV positive patients on ART.

- **Treatment in pregnancy**
    - Delaying treatment for LTBI until 2-3 months post-partum is considered unless there is a high risk of progression to TB disease (e.g., HIV infected, recent contact). http://www.cdc.gov/tb/publications/LTBI/treatment.htm

- **Treatment with breastfeeding**
    - Breastfeeding is not contraindicated in women taking INH.
    - Supplementation with 10-25 mg/d of pyridoxine (vitamin B6) is recommended for nursing women and for breastfed infants.
    - The amount of INH in breast milk is inadequate for treatment of infants with LTBI.
    - Although drugs may be secreted in breast milk, no adverse effects from these drugs on nursing infants have been demonstrated.

- **Follow Up**
    - I**f treatment has been completed:** Patients who complete a course of treatment for LTBI require no further follow-up and should be given a record of their status. “Routine” periodic chest x-rays are not indicated in the absence of signs or symptoms of active TB.
    - **If treatment has not been completed:** Patients who have discontinued treatment prior to completion, other than on the advice of a TB specialist, should be referred to the TB clinic during or after pregnancy for discussion of the potential risks and benefits of restarting treatment.
    - **If treatment is declined or contraindicated:** Persons who cannot, or will not, take treatment for LTBI are not generally followed for development of active TB.

Neither periodic clinical exams nor periodic CXR has been shown to be effective in detecting TB disease (reactivation tuberculosis) before symptoms develop, and neither is recommended.
    - Patients should keep a record of their positive skin test and understand its significance. They should be instructed to seek medical care if they develop signs and/or symptoms of active TB, such as an unexplained cough that lasts more than 2 weeks, and to remind their provider of their positive skin test.

- **Retesting**
    - Only those with ongoing risk of exposure to TB should be retested. Close contacts of known, infectious TB cases, persons likely to be exposed by travel in high-prevalence regions of the world**,** and persons who work at jobs associated with exposure (health care workers, shelter workers, corrections workers, volunteers in high risk settings) should have repeat testing.

Logistical Practice for BMC and CHC providers

- All patients should be screened for risk of TB and this should be documented under "Supervision of Pregnancy" problem. If testing is indicated (screen + for TB exposure risk) results of TB testing should also be documented in the "Supervision of Pregnancy" problem.
- Update problem list with positive TB screening: "Positive TB test" ICD9 795.51. Results of CXR and any treatment plan can be added to the problem overview.
- Place referral for TB clinic for patient in EPIC. Confirm that the woman has been seen and that a treatment plan has been made.
- Important Phone Numbers/Location of TB Clinic:
    - BPHC TB Clinic at BMC: Appointments: 617-534-4967
    - BPHC TB Clinic at BMC RN Triage office: 617-534-4875
    - Location: BMC, Preston Family Building-5th floor, 732 Harrison Ave
    - MA DPH TB Division program contact 617-983-6970; for emergency assistance call epidemiologist on duty at 617-983-6800

REPORTING: Active TB and Latent TB infection (LTBI) are reportable to the State of Mass Department of Public Health. Finding reporting forms and information here:
There are separate reporting forms for active TB and for LTBI.
http://www.mass.gov/eohhs/gov/departments/dph/programs/id/tb/instructions-for-reporting-tuberculosis-tb-in-mass.html

Patient Education/Patient Education Materials

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Patient materials regarding TB and LTBI in various languages through Boston Public Health Commision: http://www.bphc.org/whatwedo/infectious-diseases/Infectious-Diseases-A-to-Z/Pages/Tuberculosis.aspx

Appendices

Appendix I
Interpreting TST results

0-5mm induration	Negative for all
Induration ≥5mm	*Considered positive ONLY in persons at the highest risk for infection or active disease and contacts of active cases* • immunocompromised persons • Organ transplant recipients or other immunosuppressed persons • Persons with fibrotic chest x-ray findings consistent with old TB
Induration ≥10mm	*Considered positive for persons known to be at high risk for infection or disease, that is, for most of the women whom we test.*
Induration ≥15mm	Persons at low risk of TB infection, for whom testing is generally not indicated! (as high as 75% false positive rate in low risk persons when cutoff of 10-14mm is used)

Appendix II

Testing in Persons who have been vaccinated with BCG
Persons who have received BCG should be tested for LTBI as clinically indicated by the above guidelines. Positive test results in persons who have had contact with a case of TB or who come from a country with a high rate of TB should be assumed to be due to TB infection, **not** BCG, and **treatment should be recommended unless contraindicated**. Women from countries that give BCG boosters beyond infancy or in adulthood can have a positive test from the BCG itself. Countries that administer boosters have included China, Russia and Brazil. See http://bcgatlas.org for current country-specific information. **Quant Gold can be an alternative test for these women.**

References
1. CDC. Latent Tuberculosis Infection: A guide for Primary Health Care Providers. http://www.cdc.gov/tb/publications/ltbi/intro.htm
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3. American Thoracic Society, CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. Am J Respir Crit Care Med 2000; 161 (4 Pt2): S221-47.