

## SYMPTOMS

### PULMONARY TB

Consider a diagnosis of active pulmonary TB for patients with any of the following symptoms, if other causes have been ruled out and the patient's chest x-ray (lateral and PA) is abnormal.

- Cough lasting three weeks or more; often a productive cough
- Unexplained and significant night sweats, fatigue, weight loss
- Persistent fever
- Hemoptysis

### EXTRAPULMONARY TB

Consider a diagnosis of active extrapulmonary TB for patients with an apparent infection with negative (non-acid fast bacilli) bacterial cultures that does not respond to conventional antibiotic treatment. The symptoms of extrapulmonary TB depend on the body site affected.

## CONDITIONS ASSOCIATED WITH PROGRESSION TO ACTIVE TB

Patients with latent TB infection and one or more of the following conditions are at increased risk for developing active TB:

- Immunosuppression (HIV +, organ transplant, immunosuppressive medications including anti-tumor necrosis factor-alpha agents)
- Diabetes
- End-stage renal disease
- Substance abuse (especially injection drug use)
- Contact to a case of infectious pulmonary or laryngeal TB in the last 24 months
- Recent TST, or IGRA conversion (See **Screening Tools** section for definitions)
- Silicosis
- Pulmonary fibrotic lesions seen on chest x-ray consistent with prior, healed TB
- Homeless
- Hematologic or reticuloendothelial diseases (e.g., leukemia and Hodgkins' disease)
- Malnutrition and clinical situations associated with rapid weight loss (e.g., cancers of the head and neck, intestinal bypass or gastrectomy, and chronic malabsorption)
- Low body weight (more than ten percent below ideal body weight)

\*\* There is an increased likelihood of active tuberculosis in persons with a history of travel to or immigration from a "TB endemic zone" (Mexico, Central and South America, Asia, Africa, Pacific Islands, Middle East and Eastern Europe).

## DIAGNOSTIC TOOLS

### RADIOGRAPHY

Use chest x-rays to help diagnose pulmonary TB.

- Adults → PA view (PA and lateral views if suspect active TB disease)
- Children, < 5 y.o. → PA **and** lateral views



**Note:** The CDC recommends two view chest x-rays to screen for active TB in children less than 5 years old, and if resources permit, in children through 18 years of age

<http://www.cdc.gov/tb/publications/LTBI/diagnosis.htm> (see “Other Diagnostic Conditions”)

### BACTERIOLOGY

- Order an acid-fast bacilli (AFB) smear and culture for specimens taken from the body site that is suspected to have TB. The most commonly collected specimen is sputum or thick mucus that comes from the lungs. When possible, collect at least three sputum specimens before initiating treatment for active TB.
- Consider collecting a fourth sputum specimen for a TB nucleic acid amplification test (NAAT), commonly known as a MTD, or TB PCR test. They are specific for *M.tb* complex RNA. The result is generally available within a week; a positive result could lead to earlier initiation of treatment than it would take if waiting for an AFB culture result.

[http://www.cdc.gov/tb/publications/guidelines/amplification\\_tests/default.htm](http://www.cdc.gov/tb/publications/guidelines/amplification_tests/default.htm)

### SPUTUM COLLECTION:

- Instruct patient to spontaneously expectorate three sputum specimens at a 24 hour collection interval, or at a minimum, every 8 hours. At least one specimen should be collected in the early morning before eating. Ask patient to rinse his mouth (preferably with bottled water), breathe deeply, and cough up sputum from the bottom of his lungs into the specimen container. Specimens should be delivered promptly to the lab or refrigerated. If patient is unable to expectorate sputum, order sputum induction for three specimens.

### GASTRIC ASPIRATE:

- Sampling of gastric contents to find mucus that has been swept up by the respiratory tract and swallowed during the night. Order for infants and young children that cannot expectorate sputum.

<http://www.currytbccenter.ucsf.edu/products/view/pediatric-tuberculosis-guide-gastric-aspirate-ga-procedure>

## SCREENING TOOLS

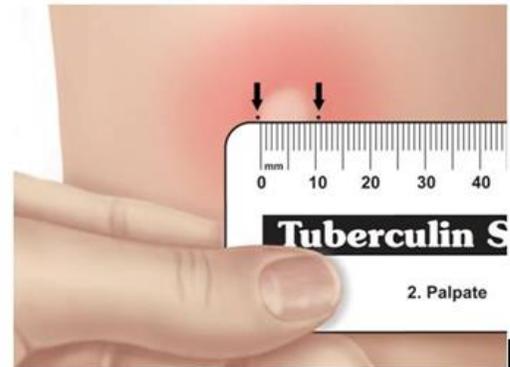
### TB SKIN TEST (TST)

The TST (also referred to as PPD) detects TB infection in patients. It can be used to complete the clinical picture for active TB, **but it cannot be used alone to rule out active TB.**



### POSITIVE TST

- 1)  $\geq 5$ mm of induration for all persons with the following conditions:
  - Known or suspected HIV infection
  - Recent contact to an active case of pulmonary or laryngeal TB
  - Chest x-ray that shows fibrotic changes consistent with TB
  - Chronic immunosuppression



- 2)  $\geq 10$ mm of induration for all persons except for those with the conditions outlined above.

### TST CONVERSION

A documented increase of at least 10mm of induration from  $<$  than 10mm to  $\geq 10$  mm of induration from a documented negative TST within the last 24 months. This indicates recent TB infection.

TWO STEP TESTING is used for persons that need serial screening for TB infection (i.e. those entering a health care setting as a resident or a worker) if they have not received a TST that was negative in the last year. If the initial TST is negative, another one is placed in 1-3 weeks to establish a baseline result

How to place and read a TST

<http://www.cdc.gov/tb/education/mantoux/part2.htm>

### **IGRA (Interferon Gamma Release Assay)**

IGRAs are in-vitro laboratory diagnostic tests approved by the FDA for detecting TB infection in people 5 years and older. These blood tests are less influenced by non-tuberculous mycobacteria and BCG than the TST. Like the TST, these tests can be used to complete the clinical picture for active TB, **but should not be used alone to rule out active TB.**

Commercially available IGRAs include the Quantiferon TB Gold In Tube and the T-Spot tests.

[http://www.ctca.org/fileLibrary/file\\_481.pdf](http://www.ctca.org/fileLibrary/file_481.pdf).

### IGRA CONVERSION

Documentation of a positive test (Quantiferon or T-Spot) drawn within the last 24 months after documentation of a negative test. This indicates recent TB infection.