

TB Skin Test Practicum
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TB Skin Test Practicum: Train the Trainer
May 19, 2015
Heartland National TB Center



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Speaker, credentials has the following disclosures to make:

- No conflict of interests
- No relevant financial relationships with any commercial companies pertaining to this educational activity



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What is the difference between

Active TB disease vs. TB Infection?

Active TB Disease



- Have active TB bacteria in their body
- Symptoms include:
 - Coughing
 - Fever
 - Weight loss
 - Night sweats
 - Hemoptysis
 - Fatigue
 - Decreased appetite

*Need treatment to cure

Latent TB Infection (LTBI)

- Has TB bacteria in his/her body that are alive but inactive
- **Does not feel sick and is NOT CONTAGIOUS**
- May become sick if the bacteria become active in his/her body
- Should consider treatment for LTBI to prevent active TB disease



Person with LTBI (Infected)	Person with TB Disease (Infectious)
Has a small amount of TB bacteria in his/her body that are alive, but inactive	Has a large amount of active TB bacteria in his/her body
Cannot spread TB bacteria to others	May spread TB bacteria to others
Does not feel sick , but may become sick if the bacteria become active in his/her body	May feel sick and may have symptoms such as cough, fever, and/weight loss
Usually has a TB skin test or TB blood test reaction indicating TB infection	Usually has a TB skin test/TB blood test reaction indicating TB infection
Radiograph is typically normal	Radiograph may be abnormal
Sputum smears and cultures are negative	Sputum smears and cultures may be positive
Should consider treatment for LTBI to prevent TB disease	Needs treatment for disease
Does not require respiratory isolation	May require respiratory isolation
Not a TB case	A TB case

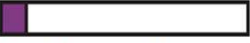
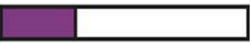
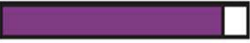
Persons at Increased Risk for Progression of LTBI to TB Disease

- HIV infection
- Children younger than 5 years of age
- Recently infected with *M.tuberculosis* (within the past 2 years)
- History of untreated /inadequately treated TB disease, including persons with fibrotic changes on chest radiograph consistent with prior TB disease;
- Receiving immunosuppressive therapy:
 - tumor necrosis factor-alpha (TNF) antagonists
 - systemic corticosteroids equivalent to/greater than 15 mg of prednisone /day
 - immunosuppressive drug therapy following organ transplantation

Persons at Increased Risk for Progression of LTBI to TB Disease

- Persons with silicosis, diabetes mellitus, chronic renal failure, leukemia, or cancer of the head, neck, or lung
- Persons who have had a gastrectomy or jejunioileal bypass
- Weigh less than 90% of their ideal body weight
- Persons who smoke cigarettes, abuse alcohol, or smokers, drug abusers/alcohol abusers
- Populations defined locally as having an increased incidence of disease due to *M. tuberculosis*, including medically underserved, low-income populations

Figure 2.5
Risk of Developing TB Disease

Risk Factor	Risk of Developing TB	Description
TB infection and no risk factors	 About 10% over a lifetime	For people with TB infection, no risk factors , and no treatment, the risk is about 5% in the first 2 years after infection and about 10% over a lifetime.
TB infection and diabetes	 About 30% over a lifetime	For people with TB infection and diabetes , and with no treatment, the risk is three times as high, or about 30% over a lifetime.
TB infection and HIV infection	 About 7% to 10% PER YEAR	For people with TB infection and untreated HIV infection and with no LTBI treatment, the risk is about 7% to 10% PER YEAR, a very high risk over a lifetime.

Testing Methods for LTBI

- Mantoux Tuberculin Skin Test

- Interferon Gamma Release Assays (IGRAs)
 - QuantiFERON TB Gold in tube (QFT)
 - T-Spot TB Test

TUBERCULIN SKIN TEST

Purpose: Targeted Skin Testing

- Strategy for controlling and preventing TB
 - Identifies and treats persons with TB disease
 - Identifies and screens contacts to TB cases
 - Screens populations at **HIGH risk** for **LTBI** (latent) and **TB disease** (active)
- Find persons who would benefit from Treatment
- Screening of LOW risk persons should be replaced by **targeted testing**.

Mantoux Tuberculin Skin Test

Mantoux tuberculin skin test

1 Administration

The Mantoux tuberculin skin test is administered to individuals who are at risk for tuberculosis (TB) infection. The test is administered by intradermal injection of 0.1 mL of tuberculin solution into the forearm.

- 1. Prepare the patient's forearm:**
 - Wash hands thoroughly with soap and water.
 - Wash the patient's forearm with soap and water.
 - Wipe the forearm with 70% alcohol.
 - Wipe the forearm with a dry cloth.
- 2. Prepare the tuberculin:**
 - Check the expiration date of the tuberculin.
 - Check the volume of tuberculin.
 - Check the concentration of tuberculin.
 - Check the lot number of tuberculin.
 - Check the name of the manufacturer.
- 3. Inject the tuberculin:**
 - Use a 27-gauge, 1/2-inch needle.
 - Use a 1-mL tuberculin syringe.
 - Use a 1-mL tuberculin syringe.
 - Use a 1-mL tuberculin syringe.
 - Use a 1-mL tuberculin syringe.
- 4. Document the results:**
 - Record the date and time of the test.
 - Record the site of the test.
 - Record the results of the test.
 - Record the name of the patient.
 - Record the name of the healthcare provider.
- 5. Provide patient education:**
 - Explain the purpose of the test.
 - Explain the results of the test.
 - Explain the next steps.
 - Explain the importance of the test.
 - Explain the importance of the test.

2 Reading

The test is read 48 to 72 hours after administration. The test is read by measuring the induration (the raised area) on the forearm.

- 1. Prepare the site:**
 - Wash hands thoroughly with soap and water.
 - Wash the patient's forearm with soap and water.
 - Wipe the forearm with 70% alcohol.
 - Wipe the forearm with a dry cloth.
- 2. Measure the induration:**
 - Use a ruler to measure the induration.
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 - Use a ruler to measure the induration.
- 3. Document the results:**
 - Record the date and time of the test.
 - Record the site of the test.
 - Record the results of the test.
 - Record the name of the patient.
 - Record the name of the healthcare provider.
- 4. Provide patient education:**
 - Explain the purpose of the test.
 - Explain the results of the test.
 - Explain the next steps.
 - Explain the importance of the test.
 - Explain the importance of the test.

3 Interpretation

The test is interpreted based on the size of the induration. The test is interpreted based on the size of the induration. The test is interpreted based on the size of the induration.

Induration of 5 mm or greater is considered positive in:

- Recent converters (i.e., those with a positive tuberculin test who were previously negative).
- Patients with organ transplants and/or those receiving immunosuppressed treatments.
- Patients with HIV infection.
- Patients with fibrotic changes on CXR consistent with prior TB.
- Patients with close contacts of infectious TB cases.
- Patients with close contacts of infectious TB cases.
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- Patients with close contacts of infectious TB cases.

Induration of 10 mm or greater is considered positive in:

- Recent converters (i.e., those with a positive tuberculin test who were previously negative).
- Patients with organ transplants and/or those receiving immunosuppressed treatments.
- Patients with HIV infection.
- Patients with fibrotic changes on CXR consistent with prior TB.
- Patients with close contacts of infectious TB cases.
- Patients with close contacts of infectious TB cases.
- Patients with close contacts of infectious TB cases.
- Patients with close contacts of infectious TB cases.

Induration of 15 mm or greater is considered positive in:

- Recent converters (i.e., those with a positive tuberculin test who were previously negative).
- Patients with organ transplants and/or those receiving immunosuppressed treatments.
- Patients with HIV infection.
- Patients with fibrotic changes on CXR consistent with prior TB.
- Patients with close contacts of infectious TB cases.
- Patients with close contacts of infectious TB cases.
- Patients with close contacts of infectious TB cases.
- Patients with close contacts of infectious TB cases.

Induration of 20 mm or greater is considered positive in:

- Recent converters (i.e., those with a positive tuberculin test who were previously negative).
- Patients with organ transplants and/or those receiving immunosuppressed treatments.
- Patients with HIV infection.
- Patients with fibrotic changes on CXR consistent with prior TB.
- Patients with close contacts of infectious TB cases.
- Patients with close contacts of infectious TB cases.
- Patients with close contacts of infectious TB cases.
- Patients with close contacts of infectious TB cases.

For more information on tuberculin tests, visit www.cdc.gov/tb.

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CDC

Tuberculin Skin Test interpretation

≥5 mm is considered positive in:

- Close contacts of infectious TB cases
- HIV-infected persons
- Fibrotic changes on CXR consistent with prior TB
- Patients with organ transplants and/or those receiving immunosuppressed treatments

Tuberculin Skin Test Interpretation

≥10 mm is considered positive in:

- **Immigrants from high prevalence countries**
- IVDU, known to be HIV neg
- **Residents/employees of high-risk congregate settings**
- Mycobacteriology lab personnel
- Children ≤ 4 years of age/ children exposed to adults at high risk
- **Persons with medical conditions that place them at high risk of progression to TB disease**

Tuberculin Skin Test Interpretation

> 15mm is considered positive in:

- persons with no risk factors

(If there is no risk, Why did you test?)

Targeted skin testing programs should only be conducted among high-risk groups

Case Scenarios: Interpreting TST

Question # 1

- Bernie, 40 year-old female tested because of job requirement to teach high school English; no known health problems and takes no medication.
 - She has a **06 mm** skin test reaction
 - Is she is Positive/Negative?

Question # 1

- Bernie, 40 year-old female tested because of job requirement to teach high school English; no known health problems and takes no medication.
 - She has a 06 mm skin test reaction
 - Is she is Positive/Negative?

- Answer : Negative

Induration of ≥ 15 mm is considered positive for this group

* She is an employee who is at low risk for TB and who is tested as part of an infection control screening program at the start of employment .

Question # 2

- Michael, 25 year-old male admitted for injectable drug detoxification; found to be HIV seropositive.
 - He has a 13 mm skin test reaction
 - Is he is Positive/Negative?

Question # 2

- Michael, 25 year-old male admitted for injectable drug detoxification; found to be HIV seropositive.
 - He has a **13 mm** skin test reaction
 - Is he Positive/Negative?
- Answer: Positive

*Induration of ≥ 5 mm is considered positive in persons with HIV

Question #3

- Richard, a 72 year old male resident of a nursing home has a:
 - **00mm** skin test reaction
 - Is he is Positive/Negative?

Question #3

- Richard, a 72 year old male **resident of a nursing home** has a:
 - **00mm** skin test reaction
 - Is he Positive/Negative?
- **Answer: Negative**

*Induration of ≥ 10 mm is considered positive in residents and employees of congregate settings such as nursing homes and other long-term facilities for the elderly

Question #4

- Rita, a 29 year old American born female tested as a work requirement for a day care center;
- Has a **12 mm** skin test reaction.
- Is she Positive/Negative?

Question #4

- Rita, a 29 year old American born female tested as a work requirement for a day care center;
 - Has a 12 mm skin test reaction.
 - Is she Positive/Negative?
- Answer: Negative

*For employees who are otherwise at low risk for TB and who are tested as part of an infection control screening program at the start of employment, a reaction of ≥ 15 mm is considered positive.

Question #5

- Martin, a 25 year old male tested as a job requirement at the state correctional institution; health history good; no known medications;
 - He has a 7mm skin test reaction
 - Is he Positive/Negative?

Question #5

- Martin, a 25 year old male tested as a job requirement at the state correctional institution; health history good; no known medications;
 - He has a 7mm skin test reaction.
 - Is he Positive/Negative?
- Answer: Negative
- Induration of ≥ 10 mm is considered positive in residents and employees of high risk congregate settings such as prisons and jails.

Question #6

- Stephanie, a 55 year old female who just received a liver transplant and has been placed on immunosuppressive medications.
 - She has a 20 mm skin test reaction
 - Is she is Positive/Negative?

Question #6

- Stephanie, a 55 year old female who just **received a liver transplant and has been placed on immunosuppressive medications.**
 - She has a 20 mm skin test reaction.
 - Is she Positive/Negative?

- **Answer: Positive**

*** Induration of >5 mm is considered positive in patients with organ transplants and other immunosuppressed patients**

Question #7

- Tony, a 19 year-old American born male enrolling in a private college; testing was an admission requirement.
 - He has a **13 mm** skin test reaction
 - Is he Positive/Negative?

Question #7

- Tony, a 19 year-old American born male enrolling in a private college; testing was an admission requirement
 - He has a **13 mm** skin test reaction
 - Is he Positive/Negative?
- Answer: Negative

*Induration of ≥ 15 mm is considered positive in persons with no known risk factors for TB.

Question #8

- Margarita, a 21 year-old female on work visa employed as a migrant farm worker; tested at the county's prenatal clinic as a part of her physical.
 - She has a **17 mm** skin test reaction
 - Is she Positive/Negative?

Question #8

- Margarita, a 21 year-old female on work visa employed as a migrant farm worker; tested at the county's prenatal clinic as a part of her physical.
 - She has a **17mm** skin test reaction.
 - Is she Positive/Negative?
- **Answer: Positive**

*Induration of >10 mm is considered positive in recent immigrants (i.e., within the last 5 years) from countries with a high prevalence of TB

Question #9

- Miyamoto, a 20 year-old Japanese male with a history of BCG vaccine at age 6 years; tested as a requirement for citizenship application.
 - He has a **7mm** skin test reaction.
 - Is he Positive/Negative?

Question #9

- Miyamoto, a 20 year-old Japanese male with a history of BCG vaccine at age 6 years; tested as a requirement for citizenship application.
 - He has **7 mm** skin test reaction.
 - Is he Positive/Negative?

Answer: Negative

*Induration of ≥ 10 mm is considered positive in recent immigrants (i.e., within the last 5 years) from countries with a high prevalence of TB

Question #10

- Naomi, a 5 year-old American-born female whose parents were Southeast Asian refugees; test was done prior to starting public school.
 - She has a **17 mm** skin test reaction.
 - Is she Positive/Negative?

Question #10

- Naomi, a **5 year-old** American-born female whose parents were Southeast Asian refugees; test was done prior to starting public school.
 - She has a **17mm** skin test reaction.
 - Is she Positive/ Negative?
- Answer: **Positive**

*Induration of >10 mm is considered positive in children less than 5 years of age.

What Do We Do if the patient has **Positive** TST Result?

- Evaluate Further
- Rule Out TB Disease
 - CXR
 - TB Symptom Screen/ Assessment
 - MD Evaluation
 - Sputum Collection
- If disease is ruled out, consider for LTBI treatment
- If patient not willing or able to take treatment, educate on TB signs and symptoms

*“the decision to test is
a decision to treat...”*



What do we **DOCUMENT** when reading the TST?

- Record date and time of reading and name of person reading TST
- Record in millimeters (mm)
 - **Do not measure in cm**
- If the patient has no reaction mark as 0 mm
 - Do not just mark the reaction as **“negative”**

Name: _____
Telephone: _____ Birthdate: _____

MANTOUX TUBERCULIN SKIN TEST RECORD			
Date Given	Date Read	Results (mm of induration)	Read By (Initials)

(IF POSITIVE, PLEASE SEE REVERSE SIDE)

POSITIVE TUBERCULIN SKIN TEST RECORD
PLEASE KEEP THIS CARD

Test Results: _____ mm
Chest X-ray showed
no active disease on _____ (Date)
INH Recommended: _____ (Date)
Started INH _____ mg on _____ (Date)
Completed INH _____ mg on _____ (Date)

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What Do We Do if the patient has **Negative** TST Result ?

- Provide Documentation of result
 - If the patient has no reaction mark as 0 mm
 - Do not just mark the reaction as “**negative**”
- No further evaluation necessary

Reading TST: Read at 48-72hrs

What do we do if client does not return within 48-72 hrs?

- If TST is **positive** measure and record induration in millimeters
- If TST is read as **negative**, repeat TST at this time



*Certain studies indicate that positive TST reactions might still be measurable 4-7 days after the TST was placed. If the TST reaction is read at ≥ 15 mm 7 days after placement, the millimeter result can be recorded and considered to be a positive result.

MMWR Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care settings, 2005. December 30, 2005/ Vol.54/ No. RR-17.pp.81

How soon may I repeat a TST if placed incorrectly?

- May be repeated right away if initial placement was incorrect



Can a person with a previous positive TST be retested?

YES

- Retesting is not necessary if the previous result was documented
- Repeated skin tests do not sensitize or make persons “allergic” to tuberculin

Can Infants Be Tested?

YES

- Infants may not react to a TST before 6 months of age, but should be tested if there is risk of exposure

Can pregnant women be tested?

YES

- No risk to mother or fetus. Pregnancy is often a good time to screen and test women who are at risk of TB

*Pregnant women with positive TST results or who are suspected of having TB disease should not be exempted from recommended medical evaluations and radiography. Shielding consistent with safety guidelines should be used even during the first trimester of pregnancy.

MMWR Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care settings, 2005. December 30,2005/Vol. 54/No.RR-17. pp. 81.

Do Vaccines interfere with TST results?

Yes

- May cause false (-) reactions, TST should be done either on the same day as vaccination or 4 -6 weeks later.

* Vaccines that might cause a false-negative TST result are measles, varicella, yellow fever, smallpox, BCG, mumps, rubella, oral polio, oral typhoid, and live-attenuated influenza

MMWR Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health Care settings, 2005. December 30,2005/Vol. 54/No.RR-17. pp. 84.

Should Gloves Be Worn When Placing TST?

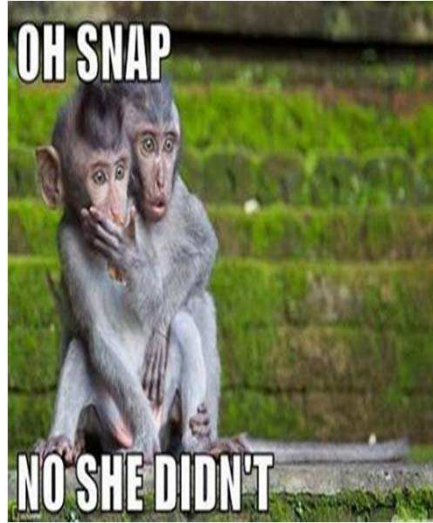
- Specific CDC recommendations do not exist regarding this topic.
- If your local area indicates that universal precautions should be practiced with skin testing, the local areas should determine what precautions should be followed in their own settings.



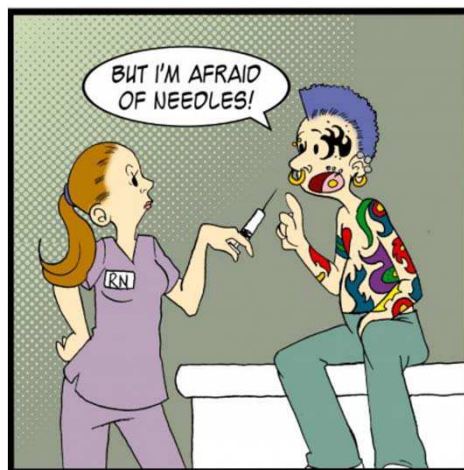
Can HCW's read their own TST?

NO!!!!!!!!!!!!

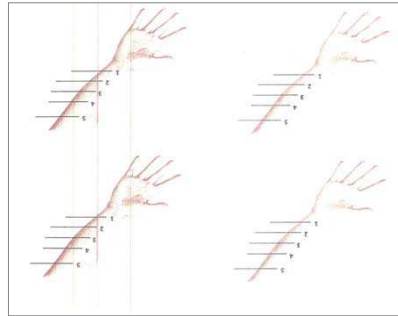
- HCW's should **NEVER** be allowed to read their own TST
- Experience has shown that HCW's do not measure their own TST results reliably



Practicum



- Break into Groups
 - Placing TST on each other
 - Reading TST mannequins
 - Hispanic
 - Asian
 - White
 - Black



Hispanic

1. 6 MM
2. 13 MM
3. 17 MM
4. 00 MM
5. 00 MM

White

1. 6 MM
2. 13 MM
3. 19 MM
4. 00 MM
5. 00 MM

Asian

1. 7 MM
2. 14 MM
3. 17 MM
4. 00 MM
5. 00 MM

Black

1. 12 MM
2. 30 MM
3. 7 MM
4. 20 MM
5. 00 MM

TST Pre-Post Test

TST Pre-Post Test: **Question #1**

- The standard recommended tuberculin skin test is the:
 - a. Tine test
 - b. Mantoux
 - c. BCG
 - d. Quantiferon-Gold

Answer: b. Mantoux

TST Pre-Post Test: **Question #2**

- The administration of the TB skin test is just beneath the surface of the skin. This is identified as a/an _____ injection.
 - a. p.o.
 - b. IM
 - c. Subcutaneous
 - d. Intradermal

Answer: d. Intradermal

TST Pre-Post Test: **Question #3**

- The correct dose for the TB skin test is:
 - a. 0.5 ml
 - b. 0.1 ml
 - c. 1.0 ml
 - d. 10 ml

Answer: 0.1 ml

TST Pre-Post Test: **Question #4**

- When placing a TB skin test, the needle bevel should be facing:
 - a. Downward to prevent leakage
 - b. In any direction
 - c. Upward
 - d. The subcutaneous tissue
- **Answer: Upward**

TST Pre-Post Test: **Question #5**

- When administered correctly, a TB skin test should produce a wheal measuring _____ in diameter.
 - a. 1 mm to 3 mm
 - b. 3 mm to 5 mm
 - c. 6 mm to 10 mm
 - d. 10 mm to 12 mm

Answer: 6mm to 10 mm

TST Pre-Post Test: **Question #6**

- After administering the TB skin test you should:
 - a. Read reaction 48-72 hours after placement
 - b. Measure the erythema and induration
 - c. Record results in millimeters
 - d. A and C
 - e. All of the above

Answer: d. A and C

TST Pre-Post Test: **Question #7**

- The diameter of the indurated area should be measured:
 - a. Vertically
 - b. Across the forearm (perpendicular to the long axis)
 - c. By adding the measurements of A and B
 - d. None of the above

Answer: Across the forearm (perpendicular to the long axis)

TST Pre-Post Test: **Question #8**

- PPD should be stored at:
 - a. 35-46 degree Fahrenheit
 - b. 46-65 degree Fahrenheit
 - c. Room temperature
 - d. None of the above

Answer: 35- 46 degrees Fahrenheit

TST Pre-Post Test: **Question #9**

- Once a vial of PPD has been opened for use you should:
 - a. Date and initial
 - b. Discard after 30 days of being opened
 - c. Keep out of light
 - d. Not use it beyond the expiration date
 - e. All of the above

Answer: e. all of the above

TST Pre-Post Test: **Question # 10**

True/ False

- TB skin testing is contraindicated if an individual has a history of having received vaccination with BCG (Bacille Calmette Guerin).

Answer: **FALSE**

TST Pre-Post Test: **Question #11**

True/False

- It is safe to do a TB skin test on someone who is pregnant if the test is indicated?

Answer: **True**

TST Pre-Post Test: **Question #12**
True/False

- A negative tuberculin skin test *a/ways* means that the individual does not have TB infection.

Answer: **FALSE**

Medical Consultation

- **1-800-TEX-LUNG (1-800-839-5864)**
- **Warm line**
 - Monday – Friday
 - 8:00am-5:00pm CST
- Response with in 24 business hours
 - Call Tuesday at 9:00am; returned call Wednesday by 9:00am
 - Call Friday at 3:00pm; returned call by Monday 3:00pm

References

- CDC Guidelines, Targeted Tuberculin Testing and Treatment of LTBI; MMWR June 9, 2000/Vol.49/No. RR-6
- CDC Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis; MMWR December 16, 2005/Vol. 54/ No. RR-15
- CDC Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health Care Settings, 2005. MMWR December 30, 2005/ Vol.54/ No. RR-17.

