

TB Testing and Health Care Employees: What You Need to Know

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Objectives

1. Discuss how the changing workforce demographic has driven the need for revised protocols for TB screening.
2. Explain how to choose the appropriate testing method for TB screening based on patient history, prior screening results, and other important factors.
3. Describe how using the appropriate test(s) based on a patient's unique factors can reduce costs, save time, and provide a more efficient hiring process.

What is TB?

- Mycobacterium tuberculosis*
- Once was leading cause of death in US
- Called consumption
- Spread by air from one person to another
- Can be deadly if not treated properly
- 1 in 3 people infected worldwide
- Globally US is barely significant

Latent TB (LTBI)

Breathe virus in and the body stops the growth of the virus

- Have no symptoms, don't feel sick
- Can't spread to others
- Usually have positive skin or blood test
- May develop TB (5-10%) if untreated

Symptoms of TB

- Bad cough lasting longer than 3 weeks
- Chest pain, coughing up blood or phlegm
- Weakness or fatigue
- Weight loss/ No appetite
- Chills
- Fever
- Night sweats

High Risk Groups

- African American Community- Higher rates of TB even with US born
- Asians- higher rate than other ethnic groups
- Correctional Facilities make up 4-6% of reported cases
- Homelessness
- 2017 9,105 TB cases per 100,000 2.8%
- 2018 9,025 TB cases
- Very little TB in US, most likely found in CA, HI, AK and NY
- Within the US 80% TB is foreign born
- HCPs have lower TB rates than general public
- 80% of active TB in HCPs is reactivation of untreated LTBI

BCG vaccination

- Common in other countries
- Latin America, Caribbean, Africa, Asia, Eastern Europe and Russia
- Likely to cause positive skin tests
- Recommended to draw blood to screen for TB
- Seeing more immigrants, if they were born in a foreign country they most likely had vaccination

INDIVIDUAL TB RISK ASSESSMENT

- Foreign travel or residence of ≥ 1 month consecutively in a country with an elevated TB rate
 - (any country other than United States, Canada, Australia, New Zealand, or a country in Western or Northern Europe)

OR

- Current or planned immunosuppression
 - including HIV infection, organ transplant recipient, treatment with a TNF- α antagonist, chronic steroids (= prednisone ≥ 15 mg/day for ≥ 1 month) or chemotherapy

OR

- Close contact with person with infectious TB disease since last TB test

If yes to any they should be considered at increased risk for TB

TB History

1. Positive TB skin test?
2. Abnormal CXR? When?
3. Mucous tested for TB? Positive?
4. Told have TB? When?
5. Taken medications for TB? When? How many? Taking them now? Finish them?
6. Live with someone with TB?
7. BCG Vaccine?
8. Lived/born /traveled in another country?

TB symptom screen

- Cough longer than 3 weeks?
- Cough up blood or mucous?
- Lost appetite?
- Lost 10 pounds or more in last 2 months without trying?
- Night sweats?

CDC Guidelines for Preventing TB Transmission in Health Care Settings – 2005

Summary of Recommendations

- At hire – symptom screen and IGRA or TST in those without prior history of TB or LTBI
- Post exposure – Symptoms evaluation and IGRA or TST for those with a negative test at baseline and without TB history
- Serial Screening and Testing – Recommended for healthcare personnel (HCP) in medium risk settings
- Follow up of LTBI positive – treatment referral and annual symptom review

Updated Guidance – May 2019

The Centers for Disease Control and Prevention (CDC) and the National Tuberculosis Controllers Association (NTCA)

2019 Recommendations - Key Changes

- **Pre-placement** - IGRA or TST with symptom assessment and individual risk assessment (new)
- **Post exposure** – Symptom evaluation and IGRA or TST testing for those with no history of prior LTBI or TB disease (unchanged)
 - **Serial Screening and Testing** (new) • Not routinely recommended
*states/facilities may screen certain risk groups of individuals
- Annual TB education of all HCP including TB exposure risks
- Follow up of LTBI positive HCP – LTBI treatment strongly recommended unless contraindication exists (new) Strongly encouraged to take antibiotics

CDC Recommendations

TABLE. Comparison of 2005* and 2019† recommendations for tuberculosis (TB) screening and testing of U.S. health care personnel (HCP)

Category	2005 Recommendation	2019 Recommendation
Baseline (preplacement) screening and testing	TB screening of all HCP, including a symptom evaluation and test (IGRA or TST) for those without documented prior TB disease or LTBI.	TB screening of all HCP, including a symptom evaluation and test (IGRA or TST) for those without documented prior TB disease or LTBI (unchanged); individual TB risk assessment (new).
Postexposure screening and testing	Symptom evaluation for all HCP when an exposure is recognized. For HCP with a baseline negative TB test and no prior TB disease or LTBI, perform a test (IGRA or TST) when the exposure is identified. If that test is negative, do another test 8–10 weeks after the last exposure.	Symptom evaluation for all HCP when an exposure is recognized. For HCP with a baseline negative TB test and no prior TB disease or LTBI, perform a test (IGRA or TST) when the exposure is identified. If that test is negative, do another test 8–10 weeks after the last exposure (unchanged).
Serial screening and testing for HCP without LTBI	According to health care facility and setting risk assessment. Not recommended for HCP working in low-risk health care settings. Recommended for HCP working in medium-risk health care settings and settings with potential ongoing transmission.	Not routinely recommended (new); can consider for selected HCP groups (unchanged); recommend annual TB education for all HCP (unchanged), including information about TB exposure risks for all HCP (new emphasis).
Evaluation and treatment of positive test results	Referral to determine whether LTBI treatment is indicated.	Treatment is encouraged for all HCP with untreated LTBI, unless medically contraindicated (new).

Abbreviations: IGRA = interferon-gamma release assay; LTBI = latent tuberculosis infection; TST = tuberculin skin test.

* Jensen PA, Lambert LA, Iademarco MF, Ridzon R. Guidelines for preventing the transmission of *Mycobacterium tuberculosis* in health-care settings, 2005. MMWR Recomm Rep 2005;54(No. RR-17). <https://www.cdc.gov/mmwr/preview/mmwrhtml/rr5417a1.htm>.

† All other aspects of the Guidelines for Preventing the Transmission of *Mycobacterium tuberculosis* in Health-Care Settings, 2005 remain in effect, including facility risk assessments to help guide infection control policies and procedures.

Screening methods

1. Tuberculin Skin Testing (TST)
2. Blood testing
 - Quantiferon

TST

1. Advantages

- Cost

2. Disadvantages

- Human Error in reading results
- False Positives
- Have to return to have test read 48-72 hours
- Should not be performed on a person with a past positive test or treatment has been completed
- Skin reactions

Quantiferon

1. Advantages

- Single visit
- Does not cause booster phenomenon
- Not affected by perception or bias
- Unaffected by BCG, preferred testing in BCG population
- No skin reaction, less likely to have to have a CXR
- Disadvantages
 - Must be processed 8-30 hours after collection

Quantiferon Gold Plus

- Blood test results in 1-2 days
- Preferred testing method
- More accurate than TST


FOLLOW-UP OF POSITIVE TEST RESULTS

HCP w/ positive (confirmed* or post-exposure) TB test:

- Chest imaging
- Symptom assessment
- Further evaluation for TB disease

All HCP w/ LTBI should be encouraged to complete LTBI treatment (“active TB prevention”) unless contraindicated (new)

- Short-course treatments are preferred (new)



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ORIGINAL ARTICLE

Three Months of Rifapentine and Isoniazid for Latent Tuberculosis Infection

Baseline Screening

1. All facility staff members upon hire
2. Assess for TB symptoms
3. 2 step TST or Quantiferon
4. Documented past positive test + CXR
5. Documented history of treatment for TB or LTBI + past positive result do not need to be screened
6. May do 1 TST if has a documented negative in last 12 months

Positive tests

- Require a chest x-ray ONCE
- If negative then yearly symptom screens, repeat x-ray if symptoms positive
- Repeat Quantiferon testing if person is considered low risk

Employer Responsibility

- Screening employees prior to testing
- Ask questions!
- English is not always first language. Ask questions as a traditional response is no when the question is misunderstood.
- Give them the results, make sure they have copies. This saves money down the line.
- Educate on symptoms and how to handle future testing.

Employee Responsibility

1. Keep copies of testing and treatments
2. Know the symptoms of TB

Treatment

	2005 Recommendations	2019 Recommendations — Key Changes
Treatment of positive TB test	Referral to determine whether latent TB infection (LTBI) treatment is indicated	<p>Treatment is encouraged for all health care personnel with untreated LTBI</p> <p>Shorter course (3 to 4 month) treatments encouraged over the longer (6 or 9 month) regimens because they are easier to complete</p>

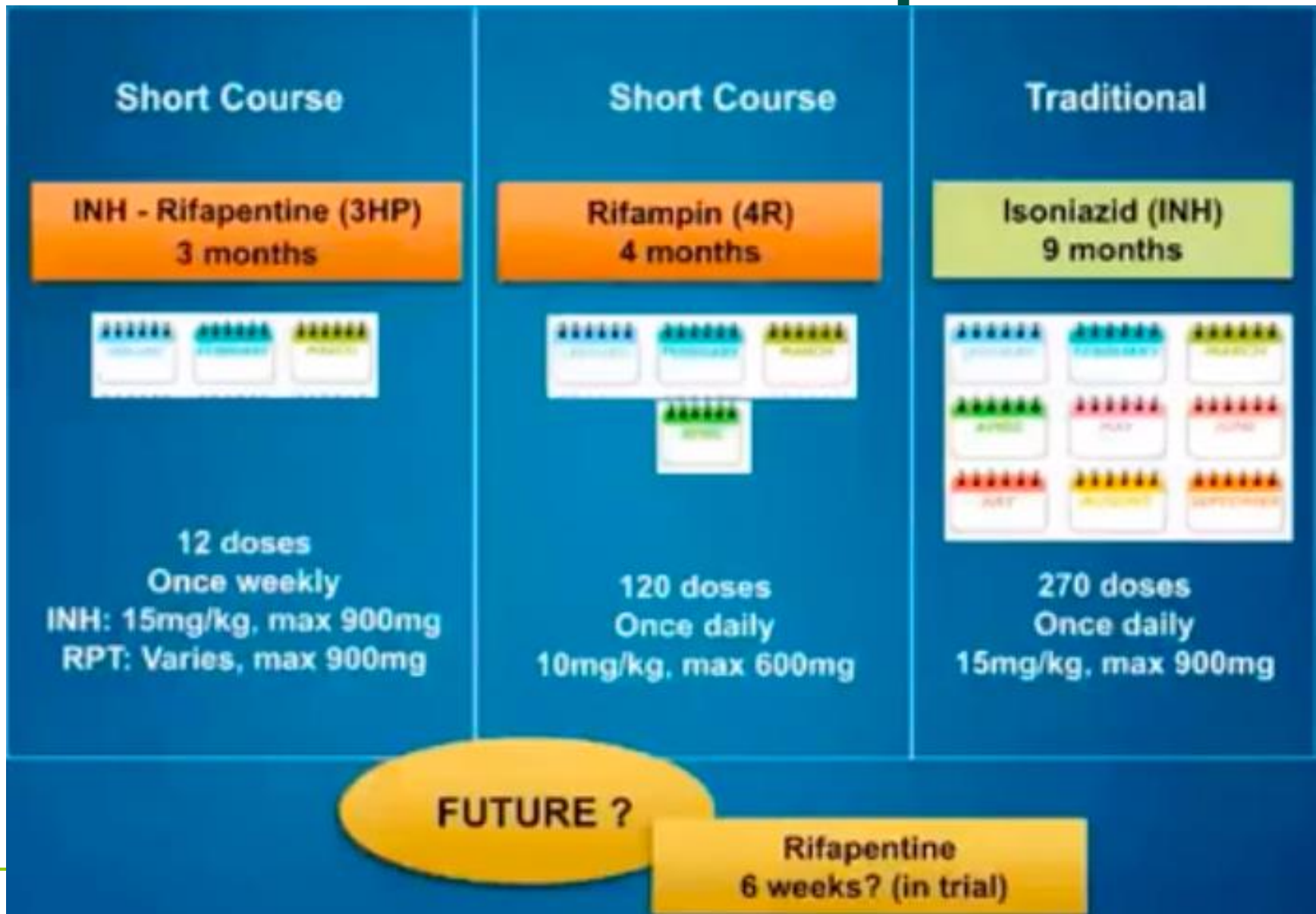
Healthcare Personnel Treatment: Untreated Latent TB Infection

- Treatment offered to HCP and strongly encouraged to complete
- HCP less likely to accept LTBI treatment than others not in healthcare
- Newer regimens are shorter, safer and cost effective
 - INH + Rifapentine weekly for 3 months, that's 12 doses total, most likely to complete regimen
 - Not as widely known, recognized, discussed or utilized

Latent TB Infection: Treatment Options

- INH and rifapentine weekly for 3 months (DOT/SAT); that's a total of 12 doses and most likely to complete
- Rifampin daily for 4 months
- INH daily (or twice weekly DOT) for 9 months
- INH daily (or twice weekly DOT) for 6 months – less effective than 9 months

LTBI Treatment Options



Healthcare Personnel Treatment: Untreated Latent TB Infection

Contraindications:

- People with HIV/AIDS who are taking antiretroviral medications with clinically significant or unknown drug interactions with RPT*
- People presumed to be infected with INH or rifampin (RIF)-resistant *M. tuberculosis*
- Pregnant women, or women expecting to become pregnant during the 12-week regimen
- Patients who had prior adverse events or hypersensitivity to INH or rifapentine

Monitoring Treatment

- Monthly visits to assess safety, adherence and adverse events
- Monthly prescriptions with refill approved after monitoring visit
- Organizational support of visits and drug costs preferred
 - Some institutions partner with local health departments
- Appropriate laboratory monitoring monthly

HCP Treatment: Untreated Latent TB Infection- Strategies for Compliance

- 12 dose (3 month, weekly dosing) course
- Use Organization's Occupational Medicine or EH departments
- Escalation from NP based clinic to Occ. Med MD to specialty departments like ID
- Referral from PCPs to ID if Occ Med or EH resources are not available
- Readdress and encourage compliance for those who decline on an annual basis
- Organization pays for the LTBI treatment course ideally

Should organization pay for Latent TB Infection Rx?

- Typically pay for HCP conversions -> LTBI but not new hires with LTBI
 - Risk management/WC/administrative decision
 - Now underlies many LTBI activations
- Ideally organization pays for LTBI Rx
 - Benchmark hospitals that do this like Penn
 - Talk of risk reduction to patients, employees and reputation as well as lawsuits
 - Use redirecting annual screening savings

Healthcare Personnel Treatment: Untreated Latent TB Infection

If HCP does not complete therapy

- Annual symptom evaluation
- Reevaluate treatment options risks/benefits for LTBI Rx
- Ongoing education between screening visits of TB signs and symptoms of infection and need for immediate eval. if these occur
- Continue to offer treatment to those who initially decline, they may change their minds with the shorter regimen options

Special Situations

MDR TB LTBI

- Follow for minimum 2 years regardless of treatment or no treatment
- Rx regimens not well researched for efficacy
- Longer treatment times; 6-12 months
- Need to know what drugs the MDR TB is resistant to
- Definitely need a consult with MDR TB expert

Special Situations

HCPs involved in research

- Non Human Primates (NHP)
 - Screen workers/researchers Q 6 or 12 months as whole NHP colony can die from TB from a worker
- MTB research
 - Screen every 6 or 12 months if aerosolizing MTB
- MTB from field work, zoos, animal parks
 - Elephants, rhinos, marine mammals can get and transmit MTB to humans
- M bovis
 - Cattle and many other animals can get and transmit to humans who work around them, vets, dairy workers, hunters
 - Screening tests and LTBI treatment are as for MTB
 - <https://www.cdc.gov/tb/publications/factsheets/general/mbovis.pdf>

Communicating the Value of LTBI Treatment

When discussing the risks and benefits of treatment it is important to explain that

- As long as TB germs are in the body, they can begin to multiply and cause disease
- Certain individuals are at especially high risk for progression to TB disease. They include persons with recent TB infection and certain medical conditions, and those taking medication that may alter immunity
- Completing treatment for LTBI can reduce the risk of TB disease by 90%
- Treatment decisions are based on the results of scientific research
- TB infection is treated with one or two drugs, whereas TB disease initially requires four drugs

Identifying Barriers to Adherence

Many variables affect a patient's adherence to the recommended treatment regimen, including:

- Appointment hours that conflict with patient's schedule
- Misinformation about TB
- Health beliefs and practices
- Limited financial resources
- Co-existing medical conditions
- Medication side effects
- Language barriers
- Real or perceived stigma related to LTBI treatment

Moving Forward

1. Controlling costs (\$200-\$300 per person)
2. Eliminating unnecessary radiation
3. Sharing information and results with employees past or present.
4. Educate those that are positive for LTBI symptoms of TB
5. Educate those that are positive for LTBI to keep records and **STRONGLY** encouraged they seek treatment

Thank you

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Questions?