



**Indiana**  
**Department**  
**of**  
**Health**

# TUBERCULOSIS & LONG TERM CARE – WHAT YOU SHOULD KNOW

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# Learning Objectives

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- Understand Tuberculosis basics and identify methods for detecting *M. tuberculosis* infections
- Understand the considerations to take into account when selecting between a TST and IGRA to test for TB infection
- Understand TB related guidelines in Indiana for the long-term care setting for both residents and staff



# TB Background



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# Tuberculosis

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- Tuberculosis (TB) is caused by the bacterium *Mycobacterium tuberculosis*
- Usually affects the lungs, but can attack any part of the body
- Divides at a slow rate



# TB Basics

- How is it spread?
  - Person-to-person through the air
  - The bacteria is expelled via coughing, speaking, or singing
- Signs and symptoms?
  - Cough greater than three weeks
  - Illustration to the right shows other symptoms

## Think TB...Test for TB

LONG-TERM  
COUGH



FEVER



FATIGUE



CHILLS



WEIGHT LOSS



NIGHT SWEATS



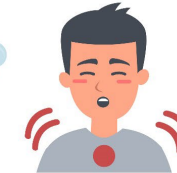
COUGHING UP  
BLOOD



NO APPETITE



CHEST PAIN



Patients may have one or more of these signs and symptoms.

# LTBI Compared to TB Disease

Person with LTBI	Person with TB Disease
Has a small amount of TB bacteria in their body that are alive but <b>inactive</b>	Has TB bacteria that are <b>active</b> in their body
Cannot spread TB bacteria to others	May spread TB bacteria to others
Does <b>not</b> feel sick	May feel sick and may have symptoms such as a cough, fever, and/or weight loss
Usually has a <b>positive</b> TB skin test or TB blood test result indicating TB infection	Usually has a <b>positive</b> TB skin test or TB blood test result indicating TB infection
Chest radiograph is typically <b>normal</b>	Chest radiograph may be <b>abnormal</b>
Sputum smears and cultures are <b>negative</b>	Sputum smears and cultures may be <b>positive</b>
Should consider treatment for LTBI to prevent TB disease	Needs treatment for TB disease
Does <b>not</b> require respiratory isolation	May require respiratory isolation

# Diagnostic Tests for *M. tuberculosis* Infection

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Currently there are two methods of testing for *M. tuberculosis* (*M. tb*) infection in the United States.

- Mantoux tuberculin skin test (TST)
- Interferon-gamma release assays (IGRAs)

# TST Summary

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- If a person is infected, a delayed type of hypersensitivity reaction is detectable two to eight weeks after infection.
- The TST is performed by injecting 0.1 ml of tuberculin purified protein derivative (PPD) between the layers of the skin (intradermally), usually on the forearm.
- The reaction to this test, the induration (the palpable hardened area), is measured 48 to 72 hours after the injection.
- Classification as positive or negative depends on the size of the induration and the patient's risk factors for TB.
  - If the test is not read within 72 hours, the test will need to be redone.



# Advantages and Disadvantages of TSTs

Advantages of TSTs	Disadvantages of TSTs
Simple to perform (e.g., no laboratory equipment required)	Requires trained personnel to administer and interpret
Low cost	Requires two or more patient visits
No need for phlebotomy	False-positive results can occur due to previous BCG vaccination
Well-established definitions of TST conversions	False-positive results can occur due to nontuberculous mycobacteria
	False-negative results can occur due to concurrent infections
	Rare adverse effects
	Can cause the booster phenomenon
	May be subject to biases and errors with TST placement and reading

# Special Considerations When Using TSTs

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Booster phenomenon:

- Some people infected with *M. tb* may have a negative TST reaction when tested years after they were infected (e.g., older adults).
- Initial skin test may stimulate (boost) ability to react to PPD.
- Subsequent positive boosted reaction may be misinterpreted as a new infection.
- May still be considered for treatment if currently at high risk for TB disease or if other vulnerable persons would be put at risk

# IGRA Summary

- IGRAs are blood tests.
- They measure a person's immune reactivity to *M. tb*.
- Blood samples are mixed with antigens (protein substances that can produce an immune response) and incubated.
- If the person is infected with *M. tb*, blood cells will recognize antigens and release interferon gamma (IFN- $\gamma$ ) in response.



# IGRA Test Types and Referrals

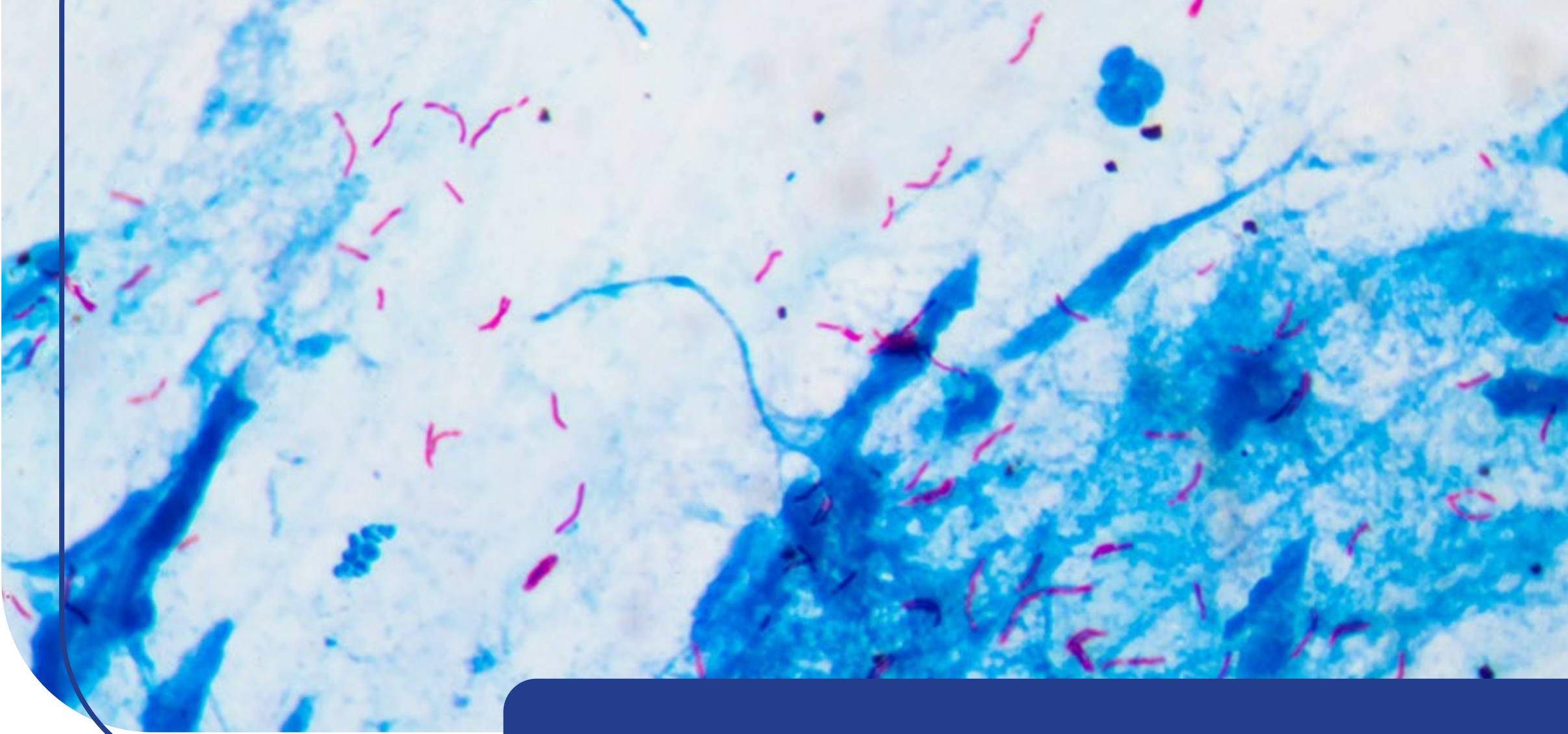
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- Currently, two IGRAs are approved by the Food and Drug Administration and available in the United States:
  - QuantiFERON® -TB Gold Plus (QFT)
  - T-Spot®.TB test (T-Spot)
- Patients can be referred to hospitals or local health departments to have an IGRA test.‡
  - A health care provider will draw a patient's blood and send it to a laboratory for analysis and results.

‡ Please note that not all hospitals and local health departments perform IGRAs. Please check before providing a referral to a specific site.

# Advantages and Disadvantages of IGRAs

Advantages of IGRAs	Disadvantages of IGRAs
Requires only a single patient visit to conduct the test	Blood samples must be processed within eight to 32 hours of collection
Results can be available within 24 hours	Errors in collecting or transporting blood specimens or in running and interpreting the test can decrease accuracy of the test
Does not cause the booster phenomenon	Tests may be expensive
BCG vaccination does not cause a false-positive result	
Not subject to the biases and errors associated with TST placement and reading	





# Selecting Which Test to Use



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# CDC Risk and Testing Strategy

<b>Risk of Infection</b> 	Household contact or recent exposure	Likely to be infected  Low to immediate risk of progression to disease  TST positive $\geq 10\text{mm}$	Likely to be infected  High risk of progression to disease  TST positive $\geq 5\text{mm}$
	Mycobacteriology lab personnel		
Immigrants from high-burden countries			
Residents/employees high-risk congregate settings			
None	Unlikely to be infected TST positive $\geq 15\text{mm}$		
<b>Population</b>	No risk factors	<ul style="list-style-type: none"> <li>• Diabetes</li> <li>• Chronic renal failure</li> <li>• IDU</li> </ul>	<ul style="list-style-type: none"> <li>• &lt; 5 years</li> <li>• HIV</li> <li>• Immune-suppressive therapy</li> <li>• Abnormal CXR, prior TB</li> <li>• Silicosis</li> </ul>
<b>Risk Factors</b>			
	<b>Risk of Developing TB if Infected</b> 		

# CDC Recommendations: Which Test to Use

Risk Group	Preferred Test	Acceptable Test
Likely to be Infected High Risk of Progression TST positive at $\geq 5$ mm	Children $\leq 5$ : TST	IGRA or TST
Likely to be Infected Low to Intermediate Risk of Progression TST positive at $\geq 10$ mm	IGRA	IGRA or TST
Unlikely to be Infected* TST positive at $> 15$ mm	IGRA	IGRA or TST

\*Testing for LTBI is not recommended in this group

### Considerations when choosing a test:

- Prevalence of BCG vaccination
- Expertise of staff and/or laboratory
- Test availability
- Patient and staff perceptions
- Programmatic concerns



# Testing for Certain Populations

Population	TST	IGRA
Unlikely to return for TST reading	Not Recommended	Recommended
History of BCG vaccine	Not Recommended	Recommended
Pregnant	Both are safe to use	
Children < 2 years	Recommended	Not Recommended

# Case Scenario One

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- 75-year-old female
- Diabetes
- Resident of an assisted living facility

TST or IGRA?

IGRA is preferred; however, either test is acceptable.

# Case Scenario Two

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- 65-year-old female
- Living with HIV
- Resident of long-term care facility

TST or IGRA?

- Either is acceptable
- Consider dual testing where a positive result from either result would be considered positive

# Case Scenario Three

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- Employee in a long-term care facility
- No other risk factors

TST or IGRA?

An IGRA is preferred; however, either test is acceptable.



# Indiana Long-Term Care Rule



# Indiana LTC Rules –Overview & Updates

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- Indiana LTC division has TB specific guidelines for both staff and residents
- TB guidelines regarding staff in LTC settings was updated in late 2019
- Guidance regarding residents was updated August of 2021
- <https://www.in.gov/health/files/LTC-Newsletter-2021-39.pdf>

# Indiana LTC Rules – Staff Screening

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- Program advisory letters were issued by IDOH's Long-Term care division in late 2019 updating expectations for Indiana licensed residential care and comprehensive care nursing facilities for preventing the transmission of *M. tb*.
- The updated guidelines indicate facilities may adopt a nationally recognized standard for TB screening for healthcare personnel and implement and follow the standard as written.
- The nationally recognized program for employees is located on the Centers for Disease Control and Prevention's website at the following link:  
<https://www.cdc.gov/tb/topic/testing/healthcareworkers.htm>

# TB Screening and Testing of Health Care Personnel (HCP)

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- All HCP should receive baseline screening upon hire that includes:
  - A baseline individual TB risk assessment
  - TB symptom evaluation
  - A TB test (Either IGRA or TST; according to risk)
  - Additional evaluation for TB disease as Needed
- Annual TB testing of health care personnel is *not recommended* unless there is a known exposure or ongoing transmission at a healthcare facility.
  - Indiana does not currently have ongoing transmission at any health care facility



# Annual TB Education for Health Care Personnel (HCP)

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- All HCP should receive TB education annually
- TB education should include:
  - TB risk factors
  - Signs & symptoms of TB disease
  - TB infection control policies and procedures
- Please reach out to IDOH TB Prevention & Care Program if you need resources for this annual education
  - Kathy Chapuran, TB Health Educator
  - [Kchapuran@isdh.in.gov](mailto:Kchapuran@isdh.in.gov)

# Post-Exposure Screening & Testing

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- All HCP with a known exposure to TB should receive a TB symptom screen and timely testing
  - IDOH and/or the local health department would already be involved at this point in the process and would provide additional guidance
- Any HCP diagnosed with Latent TB infection (during pre-employment testing or post-exposure screening) should be encouraged to take treatment
  - Several short-course regimens available
  - Free through any Indiana local health department!

# Summary of Major Changes to TB HCP Screening Guidelines

	2005 Recommendations	2019 Recommendations — Key Changes
<b>Screening</b>	<p>Recommended for all health care personnel pre-placement/upon hire*</p> <p>Annual screening may be recommended based on risk assessment of health care facility and setting</p>	<p>Individual baseline TB risk assessment added</p> <p>Annual TB screening no longer routinely recommended for most health care personnel unless occupational risk or ongoing exposure</p>
<b>Post-exposure testing</b>	<p>Recommended IGRA or TST test for all health care personnel when an exposure is recognized*</p> <p>If that test is negative, do another test 8–10 weeks after the last exposure*</p>	<p>No change</p>
<b>Treatment of positive TB test</b>	<p>Referral to determine whether latent TB infection (LTBI) treatment is indicated</p>	<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>
<b>TB education</b>	<p>Recommended annually for all health care personnel*</p>	<p>Annual education should include information about TB risk factors, the signs and symptoms of TB disease, and TB infection control policies and procedures</p>

\*No change in the 2019 recommendations

# Resident TB Screening

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- Each resident must have a health screening upon admission, including signs and symptoms of TB disease
- A TB test must be completed within three months prior to admission or upon admission unless there is documentation of a previous positive TB test.
  - **Testing can be by TST or an IGRA blood test.**
  - Two-step testing should be utilized if doing TST testing
  - The TST must be administered and read by persons having documentation of training from a department-approved course of instruction in intradermal tuberculin skin testing, reading, and recording
- Routine or baseline chest X-rays are ***not required or recommended*** prior to or at the time of admission.

# Resident TB Screening – Prior Positives

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- Residents with a documented previous positive TST or IGRA should not undergo repeat testing
- The prior positive test should have been followed by a clinical evaluation for TB that included a chest radiograph (X-ray). Results of that evaluation should be acquired by the facility and be in the patient's record.
  - There is no time limit on this evaluation.
- If documentation of this evaluation cannot be obtained, a clinical evaluation with a chest radiograph should be performed.
  - In the absence of symptoms, this can be delayed up to one week following admission

# Resident TB Screening – New Positives

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- Any asymptomatic resident with a new positive TST or IGRA must have a medical evaluation and chest X-ray **within one week**.
- Once TB disease is ruled out, the resident should be considered and evaluated for treatment
  - Latent TB infection (LTBI) treatment is available for free from your LHD
- Residents with LTBI should be screened for HIV infection
- LTBI is reportable to IDOH
  - Case reporting forms are available at the IDOH website
  - [https://www.in.gov/health/tuberculosis/information-forhealth-professionals/tb-reporting-forms/valuated for treatment of latent TB infection \(LTBI\)](https://www.in.gov/health/tuberculosis/information-forhealth-professionals/tb-reporting-forms/valuated%20for%20treatment%20of%20latent%20TB%20infection%20(LTBI))

# Resident TB Screening – Additional Info

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- Residents with symptoms of pulmonary TB and an abnormal chest X-ray consistent with TB disease should have an evaluation done as soon as possible in airborne transmission-based precautions
  - Referral to hospital is likely required
  - Medical evaluation will need to include three sputum specimens for acid fast smear and culture
  - Please notify your LHD – ***suspected*** or confirmed TB disease is reportable!
- Periodic chest X-rays of residents with a history of positive TST or IGRA are not advised and are not necessary unless the individual develops signs and symptoms of TB disease

# Summary

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- National TB recommendations should be considered when selecting which test to use for TB testing
- Indiana LTC rules have recently been updated to match national TB guidance
  - Staff screening should mirror national health care worker guidance
  - TB testing can be completed via either an IGRA or TST
  - Removal of requirement for baseline chest x-ray on residents



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# Questions

# Contact Information

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