Infectious vs Non-Infectious (TB)

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Intro to Nurse Case Management

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Nothing to Disclose

Note that different jurisdictions have different rules and regulations. Examples tools may need to be adjusted to local requirements.

- What are your rules?
- What are your local protocols?

Objective

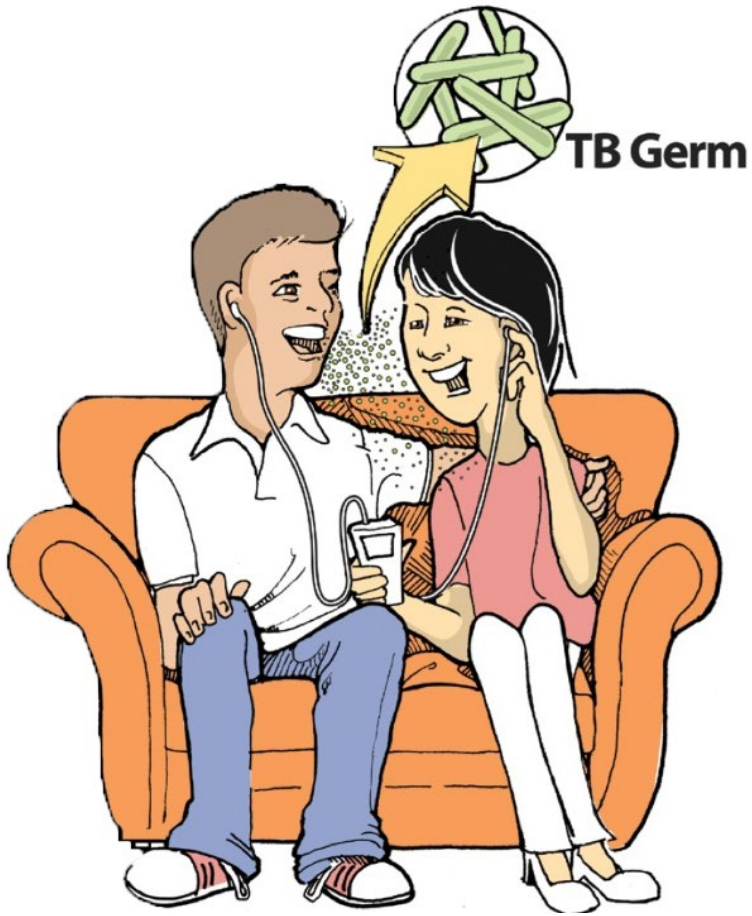
Identify when a TB patient can be considered noninfectious:

- How to determine risk of infectiousness
- How to know when it is safe to allow return to work/ school/ community activities
- Stigma & Isolation: patient centered care

Review:

TB Spreads Person to Person via Shared Air

1. Do they have TB disease?
2. Does the site of disease provide opportunity for airborne spread?



Which sites of disease can be potentially infectious?

Laryngeal TB

Pulmonary TB with or without cavitation

What about Pleural TB?

Which risk factors increase the risk of infectiousness?

Increased Risk

- Cavity
- Sputum smear positive
- Laryngeal TB
- Coughing (3+ weeks?)
- Cough inducing procedures
- Aerosolizing procedures
- Small enclosed space
- Poor ventilation
- *Increased Time sharing airspace (duration/frequency during infectious period)*

Decreased Risk

- Good cough hygiene (cover your cough!)
- Appropriate and adequate treatment (2 weeks?)

CAP	ATS	Interpretation	AFB/ml sputum	Infectiousness
Negative	Negative	Negative	<5,000	Probably not infectious
1 or 2 per smear	1 or 2 per smear	Weakly positive	~5,000	Probably infectious
<1 per field	1+	Moderately positive	~10,000	Probably infectious
1-10 per field	2+	Moderately positive	~100,000	Probably infectious
>10 per field	3+	Strongly positive	~1,000,000	Probably very infectious
	4+	Strongly positive	>1,000,000	Probably very infectious

Higher Smear = Higher Risk

TB Disease In Kids

- Typically Paucibacillary TB. Usually can't produce sputum.
- Unless Adult Type presentation (cavity, smear positive), usually not considered to be infectious

While small children aren't usually considered infectious, you want to perform a source case investigation, if unknown:

- ❖ How did they get exposed to TB?
- ❖ Is there an accompanying adult with them that has infectious, untreated TB?

How do you determine the Infectious Period?

Starts

- **3 months** before 1st respiratory symptom or 1st diagnostic finding
- *If smear negative, asymptomatic (non cavitary):* ***1 month***

Ends

- When off Isolation
- De facto: If following Isolation precautions, then exposure ends with start of Isolation period. Be aware of possible exceptions.

Table 8.1—Recommendations for Estimating the Start of the Infectious Period by Case Characteristics

Case with Respiratory TB Symptoms	Case with Positive Sputum Smear	Case with Pulmonary Cavity on Chest X-ray	Recommended Minimum Beginning of the Infectious Period
Yes	No	No	3 months before symptom onset or first finding consistent with TB disease, whichever is longer
Yes	Yes	Yes	3 months before symptom onset or first finding consistent with TB disease, whichever is longer
No	No	No	1 month (4 weeks) before date of suspected diagnosis
No	Yes	Yes	3 months before finding consistent with TB disease

https://www.cdc.gov/tb/education/ssmodules/pdfs/Modules8-508.pdf

Texas tool: TB 425

Table 2. Estimating the Beginning of the Infectious Period

A. Criteria			B. Estimated Start of Infectious Period *Select any of the following based on criteria met by client in Column A*	C. Infectious Period Start Date *Select earliest date of symptom onset listed in Table 1*
TB Symptoms	Acid Fast Bacilli (AFB) Sputum Smear Positive	Cavitary CXR		
Yes ☐	Yes ☐	Yes ☐	Three (3) months before symptom onset or first positive finding consistent with TB disease (e.g. abnormal chest radiograph) whichever is longer.	
Yes ☐	Yes ☐	No ☐		
Yes ☐	No ☐	No ☐		
No ☐	Yes ☐	Yes ☐	Three (3) months before first positive finding consistent with TB	
No ☐	No ☐	No ☐	Four (4) weeks before date of suspected diagnosis	

Source: Adapted from MMWR. 2005; 54 (No. RR-15)

https://www.dshs.texas.gov/IDCU/disease/tb/forms/PDFS/TB-425.pdf

When can Airborne Isolation (AII) be discontinued?

What is the general rule of thumb for sputum smear positive TB?

Guidance on Release from Hospital Tuberculosis Isolation[a]

Diagnostics:	Clinical Impression:	Under Airborne Isolation (AII) and discharging to:	Patient must meet all criteria:
Sputum **AFB Smear Positive** ***AND*** **NAAT Positive**	Active TB Disease	**Home—No** high risk individuals or individuals without prior exposure	• Follow-up plan has been made with local TB program and DOT has been arranged[b] • Started on standard TB treatment • All household members, who are not immunocompromised, have been previously exposed to the person with TB • Patient is willing to not travel outside the home until negative sputum smear results are received • No infants or children younger than 5 years of age or persons with immunocompromising conditions are present in the household who have not been evaluated and started on appropriate treatment
		Home—WITH high risk individuals OR **High-Risk/Congregate Setting**	Patients with infectious TB should NOT be allowed to return to a setting with high risk individuals. The patient can be *discharged* and is considered non-infectious if: • Three consectutive negative sputum smears from sputum collected in 8 - 24 hour intervals (at least one early morning specimen) ***AND*** • Started on drug regimen and tolerating for AT LEAST 2 weeks or longer ***AND*** • Symptoms have improved
Sputum **AFB Smear Negative** (or No Sputum AFB Smear Done) ***AND*** **NAAT Positive**	High likelihood of TB	**Home**—with/without high risk individuals OR **High-Risk/Congregate Setting**	• Three consecutive negative sputum smears from sputum collected in 8 to 24 hour intervals (at least one early morning specimen) • Started on standard TB treatment and tolerating for AT LEAST 5 days • A plan has been made to follow-up on culture results • No infants or children younger than 5 years of age or persons with immunocompromising conditions are present in the household who have not been evaluated and started on appropriate treatment
Sputum **AFB Smear Negative** ***AND*** **NAAT Negative**	High likelihood of TB	**Home**—with/without high risk individuals OR **High-Risk/Congregate Setting**	

AFB - Acid-fast bacilli *AII - airborne infection isolation* *DOT - Directly Observed Therapy* *DST - Drug Susceptibility Testing* *MDDR - Molecular Detection of Drug Resistance* *MDR - Multi-drug resistant* *NAAT - Nucleic Acid Amplification Test* *TB - Tuberculosis* *XDR - Extensively-drug resistant*

[a]Pulmonary Tuberculosis

[b]The hospital and/or treating clinician should contact the local health department prior to release of a patient with confirmed active TB disease.

https://www.heartlandntbc.org/wp-content/uploads/2021/12/guidelines_home_hospital_infectious_patients.pdf

What if your patient was never sputum smear positive?

How much treatment does your jurisdiction require to discontinue Isolation?

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[a]Pulmonary Tuberculosis

[b]The hospital and/or treating clinician should contact the local health department prior to release of a patient with confirmed active TB disease.

Texas tool: TB 425

Table 3. Estimating the End of the Infectious Period (Release from Respiratory Isolation) for clients with drug susceptible TB

A. Criteria		B. Check (√) when criteria is met	C. Infectious Period End Date *Type the date the selected criteria in Column A was met.*
When patient has POSITIVE AFB sputum smear at diagnosis	1. Three (3) consecutive negative AFB sputum smears, collected in 8 to 24 hour intervals (one should be an early morning specimen)		
	2. Symptomatic improvement		
	3. Effective multi-drug therapy for tuberculosis **for at least the equivalent of two weeks** given as directly observed therapy (DOT)		
	4. Completely adherent with DOT		
	5. Drug resistance is not suspected or confirmed		
When patient has three consecutive NEGATIVE AFB sputum smears at diagnosis and has never had a positive sputum specimen	1. Three (3) consecutive negative AFB sputum smears, collected in 8 to 24 hour intervals (one should be an early morning specimen)		
	2. Symptomatic improvement		
	3. Multi-drug therapy for tuberculosis for **at least 5 days** given as DOT		
	4. Completely adherent with DOT		
	5. Drug resistance is not suspected or confirmed		

Source: Adapted from MMWR. 2005; 54 (No. RR-12)

https://www.dshs.texas.gov/IDCU/disease/tb/forms/PDFS/TB-425.pdf

What are your policies regarding discharge from hospital to the home?

Not all TB patients need to be hospitalized.

If still on AII, what are your rules and policies for discharge home?

Patient Centered Care: Home Based Isolation

Discharge Home on Isolation can be done if:

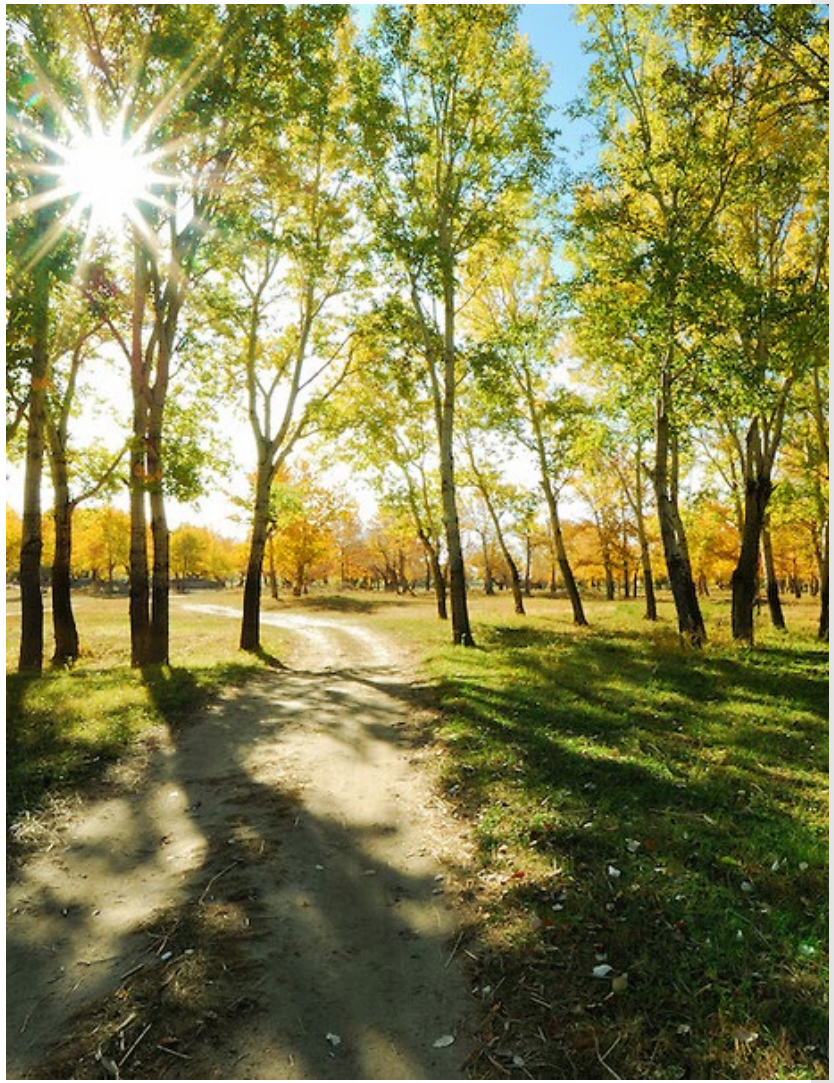
- Follow-up plan has been made with local TB program and DOT has been arranged
- All household members, who are not immunocompromised, have been previously exposed to the person with TB
- Patient is willing to not travel outside the home until negative sputum smear results are received
- No infants or children younger than 5 years of age or persons with immunocompromising conditions are present in the household who have not been evaluated and started on appropriate treatment

Reasons to hold discharge:

- Going to congregate setting that doesn't have a negative pressure room: alternative arrangements may be needed.
- Cannot be discharged to safe environment: need to find safe location while on Isolation. (Safe for patient and safe for community.)
- Unable to be discharged with enough meds to continue care. May need to hold for arranging procurement of meds.

Patient Centered Care: Tips

- Goal: no sharing of airspace with non-household members.
- Use Sunlight and Ventilation: Outside is safe!
- Patient wears a surgical mask, not a N-95, when needed.
- If patient can't work, can the family pay their bills? May need linkages to social services.
- If patient lives alone, how will meals be arranged?
- Some patients culture convert before their smears become negative.
- Isolation impacts mental health.
- Support Group: https://www.wearetb.com/



Use non-Stigmatizing Language

Isolation ≠ Segregation

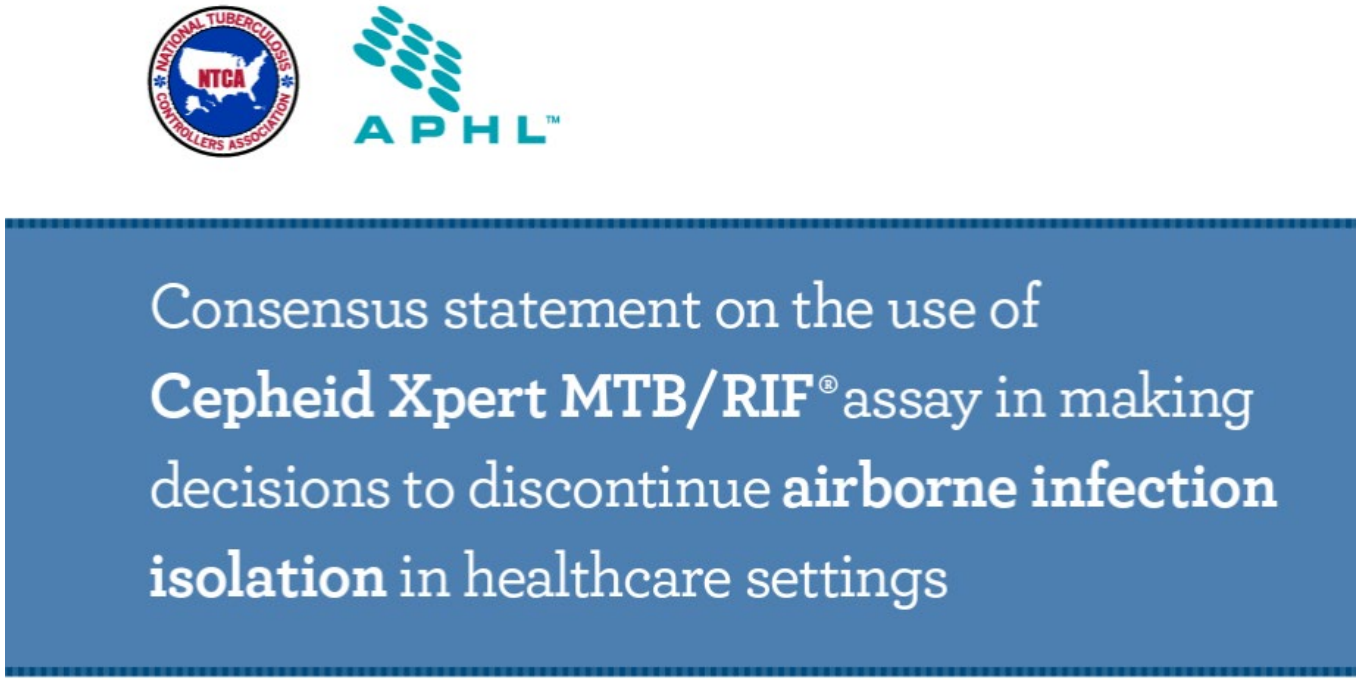
- **Isolation** is the separation of ill persons who have a communicable disease from those who are healthy and restriction of their movement to stop the spread of that disease or illness.

- **Segregation** is a system that keeps different groups separate from each other, either through physical dividers or using social pressures and laws.

Scenario 1

- 64 year old, US born, white male. Smoker. History of foreign travel while serving in the military, including deployments in Asia. Hospitalized with chronic cough, hemoptysis. Sputum 3+ on smear. What should the hospital do?
  - Follow Airborne Isolation (if not already implemented)
  - Order NAA to see if it's due to MTB
- Results: NAA did NOT detect MTB
- Can they release patient from Airborne Isolation?

NAA: Xpert and Release from Isolation



- https://www.tbcontrollers.org/docs/resources/NTCA_APHL_GeneXpert_cover_50.jpg

Scenario 2

- 28 year old from India. Works in IT. Is still 3+ on sputum smear after 2 weeks of standard TB treatment. NAA+, no RIF mutation.
- He is asking when he can back to work.
  - If he can work 100% remotely, there are no public health restrictions.
- His mom wants him to come back home for a wedding. Can he fly back to India?
  - Not until he is off Isolation.

Returning to Work, School, & Community Activities

- Able to return to work or school and take public transportation when off isolation
- Will need to continue TB medication to cure.
- Mask is no longer necessary
- Contacts will need to be retested 8-10 weeks after break in contact
  - *Note that household contacts who continued to live with patient should be tested 8 weeks after end of Infectious Period. That might be the culture conversion date if that is earlier than sputum smear conversion.*

Scenario 3

- 38 year old US born female health care worker with a history of working in medical settings in Africa. You have just received a lab report that an intestinal biopsy sample has been identified to have MTB.
- Q: Can she continue to work at the hospital?
  - A: pulmonary involvement needs to be ruled out
- Chest xray shows an infiltrate in the RUL. Sputums are smear negative x 3, NAA detected MTB with no RIF mutation. What other details would you want to know before determining when she can return to work?
  - A: Current treatment and response to treatment
  - A: Nature of work and if patient population is high risk (immuno-compromised or young children)

Final Question: How do you know if someone was infectious?

Answer: through the Contact Investigation data.

Comments
Thoughts
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