



Updates to Respiratory Isolation Restrictions for Tuberculosis

Recommendations from the Wisconsin Tuberculosis Program

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Agenda

- Overview of TB Transmission
- Current Respiratory Isolation Restrictions
- Updated Recommendations
- Why Update the Guidance?
- Questions



Tuberculosis

What is it?

- Spreads from person to person through the air.
- Is caused by bacteria called *Mycobacterium tuberculosis*.
- Usually attacks the lungs but can attack any part of the body.

**TB spreads
through the air**
when someone
with contagious TB
coughs, speaks, or
sings.





Isolation

- The practice of separating individuals with TB from others dates back to the 1800s.
- In 1854 the first sanatorium for TB was established.
- In the 1960s sanatoriums gradually closed due to the development of medications that were effective in treating TB.



Current Respiratory Isolation Restrictions

Patients can be considered noninfectious when they meet **all** of the following criteria:



AFB Sputum Smears

Three consecutive negative AFB sputum smears collected in 8-to-24-hour intervals with at least 1 being an early morning specimen.

AND



Clinical Improvement of Symptoms



The patient's symptoms have improved clinically (for example, they no longer have a fever, and their cough has improved).

AND



Adequate Therapy

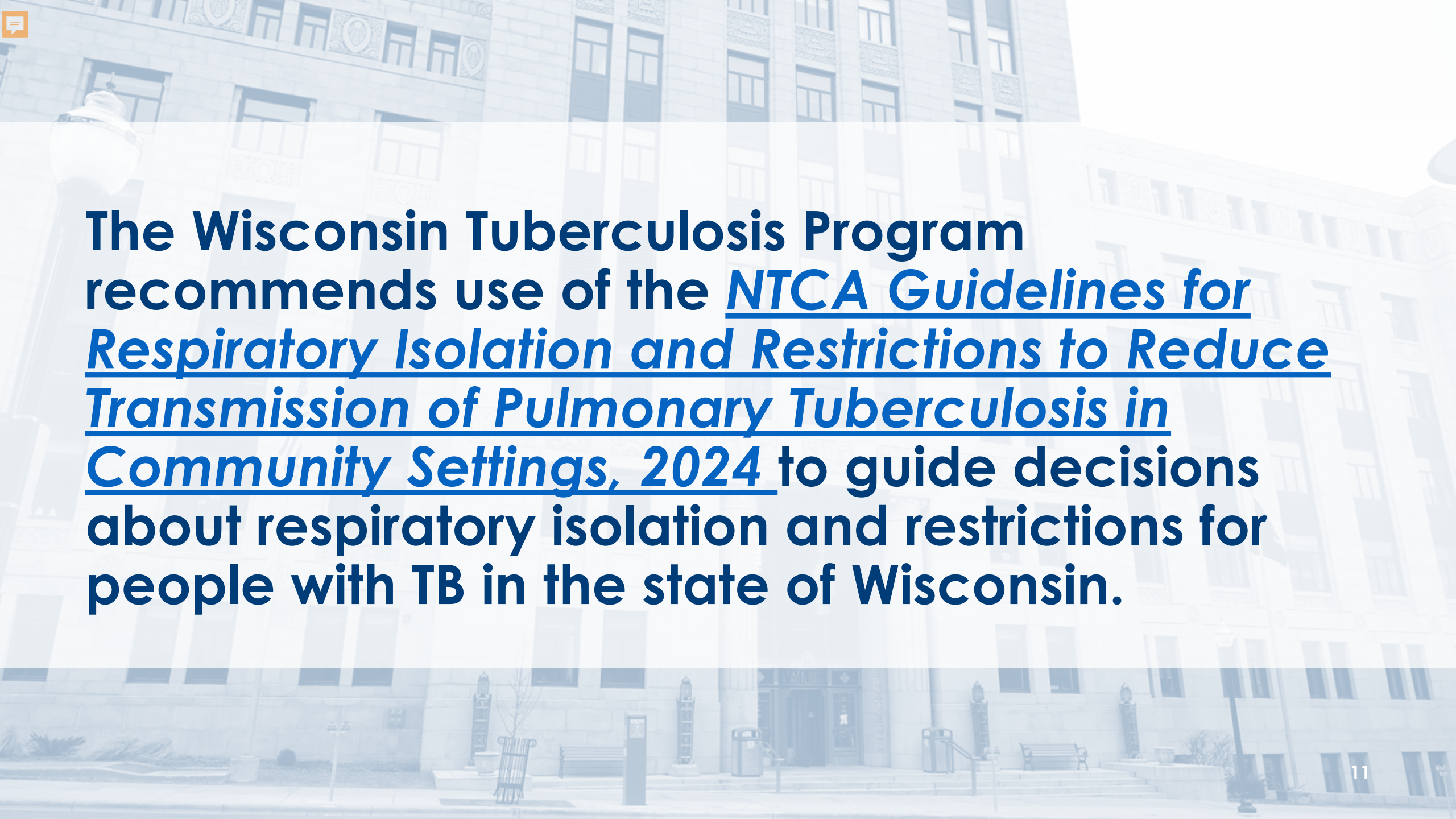
The patient has completed treatment with an adequate treatment regimen for at least 2 weeks or longer.



Updated Respiratory Isolation Restriction

Wisconsin Tuberculosis Program Recommendations



The background of the slide is a faded, light blue image of the Wisconsin State Capitol building. The building features classical architectural elements such as columns, arches, and a prominent dome. The text is overlaid on this background.

The Wisconsin Tuberculosis Program recommends use of the *NTCA Guidelines for Respiratory Isolation and Restrictions to Reduce Transmission of Pulmonary Tuberculosis in Community Settings, 2024* to guide decisions about respiratory isolation and restrictions for people with TB in the state of Wisconsin.



Spectrum of Respiratory Isolation Restrictions

Extensive Restriction

Midlevel/ Moderate
Restriction

No Restriction

Spectrum of Respiratory Isolation Restrictions

Extensive
Restriction

Midlevel/ Moderate
Restriction

No Restriction

← All confirmed TB cases
before therapy is started
or pulmonary TB ruled out

Spectrum of Respiratory Isolation Restrictions

Extensive
Restriction

Midlevel/ Moderate
Restriction

No Restriction

All pulmonary TB patients
for the first five days of
therapy



Spectrum of Respiratory Isolation Restrictions

Extensive
Restriction

Midlevel/ Moderate
Restriction

No Restriction



Once released from
isolation



Determining Infectiousness and Risk

Level of
bacterial
burden

Location of
infection

Overall risk of
transmission
to others



Extensive Restriction

Individuals should **strictly limit their movement** to an agreed upon location, **such as their home.**



Extensive Restriction

Any exceptions to extensive RIR should be **discussed and agreed upon with the local or Tribal health department officials.**

When an individual leaves the primary site of RIR, **additional measures to reduce TB transmission risk may be warranted.**

Visitors not living in the residence **should be avoided** unless approved by the local or Tribal health department. Any approved visitors should **wear appropriate PPE.**



Midlevel/Moderate Restrictions

Individual spends the majority of time **at an agreed upon location**, such as their home.



Midlevel/Moderate Restrictions

Individual may leave the location for **most outdoor activities** and **some indoor activities** deemed **essential**, as determined through discussion with local or Tribal health department officials.

Visitors should be avoided unless approved by the local or Tribal health department and should wear appropriate PPE.



Essential Definition

Essential activity is defined as activities critical for the health of the individual, such as picking up food and/or medication.





What should be considered?

- Location
- Infection control
- Level of contact
- High risk settings
- What is considered essential?





Duration of Treatment

Recommendation 3: Determining Infectiousness

ATT status	Pretreatment respiratory bacterial burden ^a	Assessment of individual infect
Pretreatment	High	Highest (Rec 3.1)
	Low	Moderate (Rec 3.1)
Treatment ≤5 d	High	Moderate (Rec 3.2)
	Low	Moderate/low (Rec 3.2)
Treatment >5 d	High	Low (Rec 3.3) ^b
	Low	Lowest (Rec 3.3)



No Restrictions

Individuals have no restrictions and may engage in daily activities as usual, irrespective of setting or potential contacts.



Updated Recommendations

Isolation

- **All** individuals should remain in extensive restrictions *at least* until adequate therapy is started.
- All people newly diagnosed with respiratory tract TB should remain in midlevel/moderate restrictions at a minimum until they have been on **therapy** for *at least 5 days via DOT* and clinically improved.



A Note About Extrapulmonary TB

- All individuals with extrapulmonary TB should remain in extensive restrictions until they have been evaluated for respiratory tract TB through:
 - Symptom evaluation
 - Chest imaging
 - Sputum collection



Why Change the Guidance?

Evidence

Ethical Framework

Socioeconomic and Cultural Barriers



Evidence

PICO Questions:

1. Does respiratory isolation improve or worsen outcomes among persons with pulmonary TB when compared with no isolation?
2. Does respiratory isolation improve or worsen outcomes among persons with pulmonary TB when compared with masking?



Systematic Review Findings

3691 studies were identified in the search

Of which, **17 were included for analysis:**

- 1 study had a direct comparison of isolation versus no isolation
- 1 randomized controlled trial
- 1 quasi-experimental pre/post study
- 1 cohort study
- 3 modeling studies
- 3 quantitative descriptive studies
- 1 mixed-methods study
- 7 qualitative studies



Summary of Evidence

Type of Evidence	Brief Summary	Location and Date
Randomized trial	Persons with TB randomized to sanatorium versus home-based treatment with INH and PAS; no difference in LTBI or TB disease among household contacts over 5 y; “major risk to contacts resulted from exposure to patient before diagnosis”	Madras, India, 1956–1959 [16]
Retrospective cohort	Persons with TB discharged from the hospital on treatment while still TB culture positive (majority also AFB smear positive) compared with persons with TB who were AFB smear and culture negative at discharge from hospital; no difference in TST conversion among household contacts	Arkansas, 1967–1971 [17]
Experiment	Guinea pigs susceptible to TB infection exposed to air vented from a TB ward; treatment of persons with TB with INH, PAS, and SM reduced transmission to guinea pigs by 98% immediately compared with untreated persons with TB	Baltimore VA TB Ward, 1959–1961 [18]



Summary of Evidence

Experiment	Guinea pigs susceptible to TB infection exposed to air vented from MDR TB ward; TST conversions in guinea pigs showed infection of 1 (1%) of guinea pigs after 3 mo of exposure to 27 persons with MDR (most AFB smear positive) on treatment with regimen of levofloxacin, kanamycin, ethionamide, and either ethambutol or prothionamide	South Africa, ~2007–2012 [19]
Transcriptomic analysis	Analysis of TB isolates from respiratory aerosols of 7 persons with drug-susceptible TB on TB treatment with rifampin, INH, PZA, and ethambutol showed immediate downregulation of transcription of genes involved in TB virulence and infectiousness after 1 d of treatment	Mumbai, India, 2018–2020 [20]

Abbreviations: AFB, acid-fast bacilli; INH, isoniazid; MDR, multidrug resistant; LTBI, latent tuberculosis infection; PAS, para-aminosalicylic acid; PZA, pyrazinamide; SM, streptomycin; TB, tuberculosis; TST, tuberculin skin test.

[Duration of Effective Tuberculosis Treatment, Not Acid-Fast Bacilli \(AFB\) Smear Status, as the Determinant for De-isolation in Community Settings | Clinical Infectious Diseases | Oxford Academic \(oup.com\)](#)

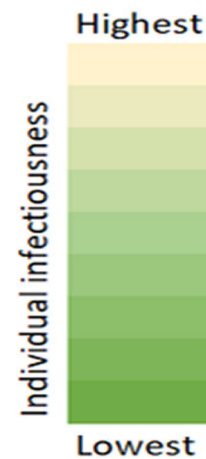
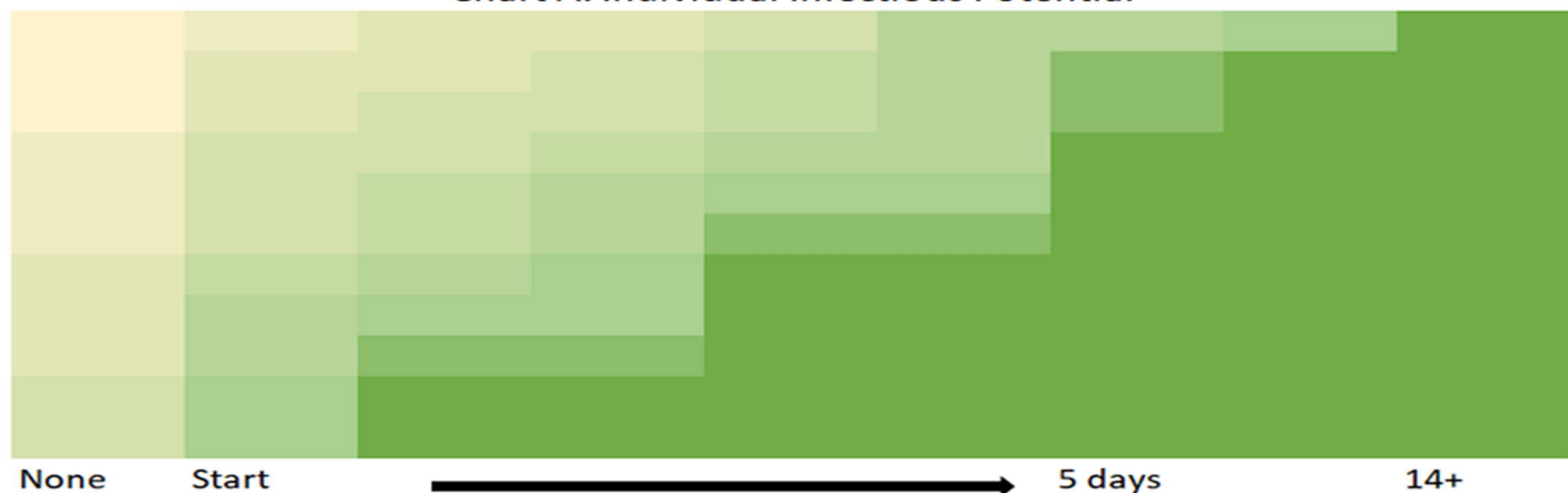


Chart A: Individual Infectious Potential

High pre-treatment bacterial burden and cough/aerosolization

Disease characteristics*

Low pre-treatment bacterial burden and cough/aerosolization



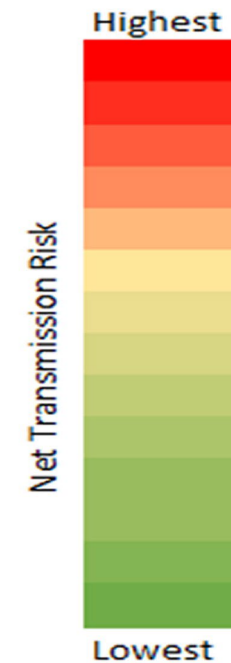
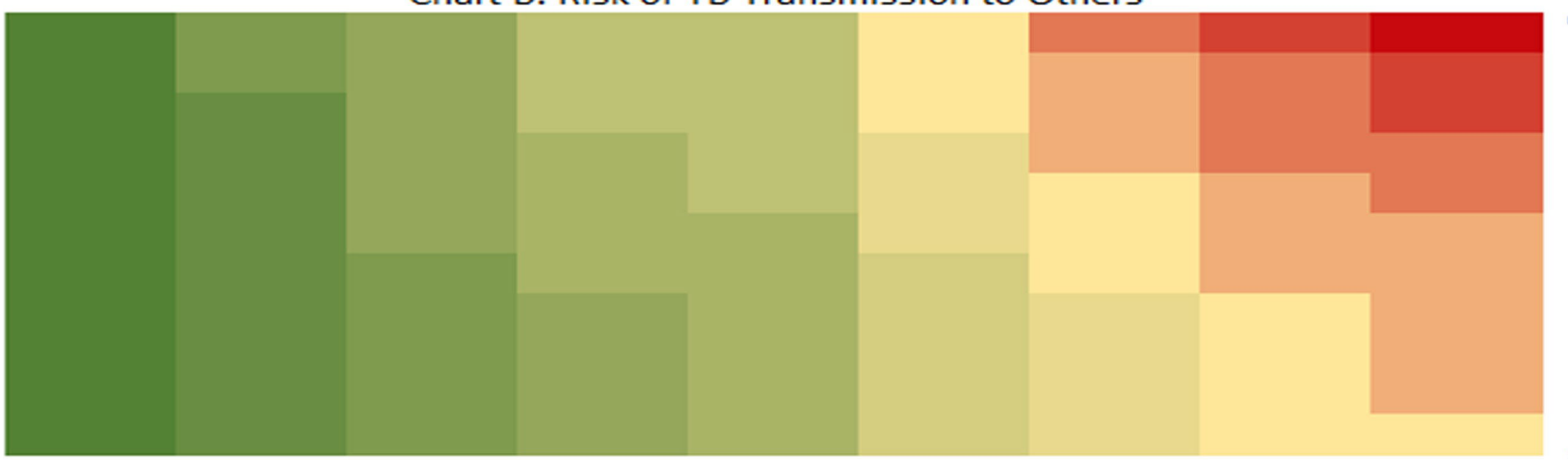
Effective Anti-Tuberculosis Treatment Duration

Chart B: Risk of TB Transmission to Others

Prolonged, frequent close contact in poorly ventilated environments

Setting and exposure characteristics

Transient exposures in well ventilated environments





Recommendations

Recommendation 3.2—PWTB on less than 5 days of effective treatment should be considered relatively more infectious than those on longer durations of effective therapy.

Recommendation 3.3—PWTB on effective treatment for at least 5 days should be considered noninfectious or with a low likelihood of infectiousness, regardless of sputum bacteriologic status during treatment.

A pair of black scales of justice is shown in a close-up, slightly blurred view. The scales are positioned on a wooden surface, and the background is a soft, out-of-focus light blue and white. The scales are the central focus of the image, symbolizing balance, justice, and ethics.

Ethical Framework

Unique Perspective of Public Health

Balance between individual and population health benefits and harms.

Historically, protection of public health has come at the expense of the individual with TB.



Socioeconomic and Cultural Barriers

- Financial impacts
- Educational impact
- Community and religious impacts





Limitations

This updated guidance is for **community and non-congregate settings only** and does not address:

- Drug resistance
- Sputum Collection
- Other vulnerable populations (infants and children under 5 years of age, people living with HIV, and others)





Wisconsin Administrative Code DHS 145.11

- **Discharge from isolation or confinement.** The local health officer or the department shall authorize the release of a person from isolation or confinement if all the following conditions are met:
- **(1)** An adequate course of chemotherapy has been administered for a minimum of 2 weeks and there is clinical evidence of improvement, such as a decrease in symptom severity, radiographic findings indicating improvement, or other medical determination of improvement.

Wisconsin Administrative Code DHS 145.11 continued

- **(2)** Sputum or bronchial secretions are free of acid-fast bacilli.
- **(3)** Specific arrangements have been made for post-isolation or post-confinement care.
- **(4)** The person is considered by the local health officer or the department not to be a threat to the health of the general public and is likely to comply with the remainder of the treatment regimen.

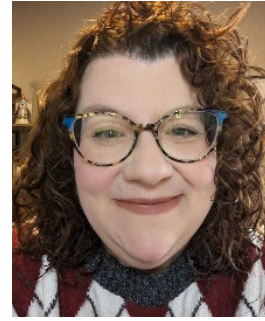
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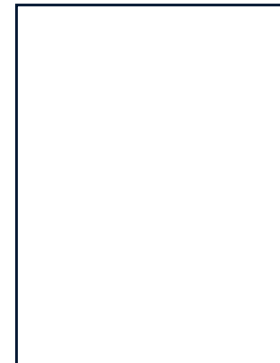
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Questions?

Thank you!





Lets Practice!



Bob has been diagnosed with pulmonary TB. His sputum smears were +3 and GeneXpert indicated no rpoB mutation. He has completed 7 days of treatment via DOT and his symptoms have improved. What isolation tier should he be placed into?



Mort has been diagnosed with extrapulmonary TB. Mort reports no respiratory symptoms so CXR was not done. What isolation tier should he be placed into?



Tina has been diagnosed with pulmonary TB. Her sputum smears were +1, we do not have GeneXpert results yet. She does not have symptoms and has completed 2 days of treatment via DOT. What isolation tier should she be placed into?



Linda has pulmonary TB. Her sputum smears were +2 and GeneXpert indicated an rpoB mutation is present. She has completed 5 days of treatment via DOT and her symptoms are improving. What isolation tier should she be placed into?



Teddy has pulmonary TB and has completed 3 days of DOT. Sputum smears were +2 and GeneXpert indicated no rpoB mutation. He wants to work in his garden today. Is this allowed in the isolation tier that he falls into?