Latent Tuberculosis Infection (LTBI) Transcript

MINNESOTA CENTER OF EXCELLENCE IN NEWCOMER HEALTH MICROLEARNING SERIES

Hello, I'm Dr. Andrea Shahum. I'm an infectious disease physician, and I work at Infectious Disease & Travel Clinic with HealthPartners in Minnesota. Welcome to the Minnesota Center of Excellence in Newcomer Health's microlearning series. This series is designed to help health care providers, clinical teams, and public health workers better understand best practices for newcomer health.

Today's learning objectives for this microlearning are to review tuberculosis or TB infection, epidemiology, provide screening recommendations, and discuss the diagnosis and treatment of latent TB infection or LBTI.

TB infection is caused by the acid-fast bacillus *Mycobacterium tuberculosis*. It spreads primarily through airborne particles released when a person with active pulmonary or laryngeal TB coughs, sneezes, sings, or talks. TB disease most commonly affects the lungs but it can disseminate to almost any organ system resulting in extrapulmonary disease. Clinically, infection exists within a spectrum of bacterial metabolic activity and immunologic response, presenting as either latent TB infection or active TB disease.

Approximately 70% of TB exposures do not result in infection due to effective immunity, while roughly 30% result in infection. LTBI occurs when live bacteria persist, but the immune system contains them. People with LTBI have no symptoms, and are not contagious, though about 10% will progress to active TB disease, especially if immunity becomes compromised. In active TB disease, bacteria actively replicate, causing symptoms, and depending on the site, potentially transmitting infection to others.

TB remains a major global health issue, with high-burden regions including Africa, Asia, Eastern Europe, Latin America, and the Pacific Islands. In the United States, an estimated 12.4 million people have LTBI and about 73% of them were born outside the country. Roughly 80% of active TB cases arise from LTBI reactivation rather than new transmission, underscoring the importance of identifying and treating LTBI as a key TB control strategy.

TB screening should target persons with either epidemiologic risk of infection or biologic risk for progression from LTBI to active TB disease. Epidemiologic risk include birth in or extended time in a high-burden country, history of homelessness or incarceration, and close contact with someone with infectious TB disease. Biologic risk factors involve immunosuppressive conditions or treatments that increase the likelihood of progression to active TB disease.

Screen for TB infection only if a person has at least one either epidemiological or biological risk factor.

Initial TB tests identify an immune response to *Mycobacterium tuberculosis*, rather than detecting the bacteria itself. Two main types are interferon-gamma release assay or IGRA, and the tuberculin skin

test or TST, key differences are summarized in the table. A positive test result cannot distinguish LTBI and active TB disease. A negative result does not exclude either, especially in immunocompromised patients or those with recent exposure. IGRA is preferred for individuals with prior BCG vaccination, as it is less likely to produce false positives.

People who test positive for TB infection should be assessed for active TB disease.

All patients with a positive IGRA or TST should undergo symptoms review, a focused physical exam, and chest X-ray to assess for active pulmonary TB disease. If findings suggest active TB disease, the next is microbiological testing with three sputum samples for AFB smear, culture, and nucleic acid amplification. When extrapulmonary TB is suspected, appropriate specimens, such as lymph node tissue, pleural or peritoneal fluid, urine, or stool should be collected.

TB contact investigations are typically conducted by public health authorities. A contact is anyone with close exposure to someone with active pulmonary disease. Close contacts should be screened with either IGRA or TST promptly. If negative, testing should be repeated eight to 10 weeks after the last exposure. Positive results warrant evaluation for active TB disease. For children under 5, preventative LTBI treatment or window prophylaxis is recommended even if the initial test is negative, due to their high risk for rapid progression to active TB with more severe disease. Treatment is discontinued if the repeat test is negative. Exposure to multidrug-resistant TB requires consultation with an infectious disease specialist.

People with latent TB infection should receive preventative therapy to reduce the risk of progression to active TB disease.

Before starting LTBI therapy, screen all patients for HIV and, if childbearing potential for pregnancy, as this may affect the treatment plan. Review all medications for potential interactions, particularly with rifamycins. Four main LTBI regimens exist with various durations: two combination therapies and two monotherapies, with rifampin or isoniazid. During treatment, patients should be closely monitored for signs of active TB, adherence, and adverse effects.

LTBI regimens in children are generally the same as in adults, except rifapentine-containing regimen is only used in children aged 2 years and older. Dosing is weight-based, so regular weight monitoring and dose adjustments are essential. While monitoring for adverse effects is important, children generally have a lower risk of hepatotoxicity than adults.

Rifamycin-containing regimens are preferred due to shorter treatment duration and lower patient burden. However, the final regimen should consider liver risk and drug interactions. Contraindications include severe reactions, for example anaphylaxis or severe liver disease. If risks outweigh benefits, educate the patient, document LTBI, and reassess periodically.

People living with HIV have a higher risk of progression to active TB, about 10% per year. In pregnancy and breastfeeding, LTBI treatment is often delayed until a few months postpartum to reduce hepatotoxicity after active TB disease has been ruled out.

Thank you for listening to today's training. Please refer to the supplemental information document posted on the COE website, and visit the CDC website to learn more about LTBI.

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