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Author manuscript

*J Am Geriatr Soc.* Author manuscript; available in PMC 2018 June 01.

Published in final edited form as:

*J Am Geriatr Soc.* 2017 June ; 65(6): 1139–1140. doi:10.1111/jgs.14752.

## Detect to Prevent: Evaluating Testing and Treatment Practices for Latent Tuberculosis Infection in Long-Term Care Facilities

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Approximately 15,500 nursing homes provide a mixture of short-term skilled nursing and long-term custodial care to millions of frail and older persons each year in the United States. While on a given day, there are an estimated 1.4 million U.S. nursing home residents, over the course of a year, more than 2 million individuals enter nursing homes for short-term, skilled nursing and rehabilitation services. The prevalence of latent tuberculosis infection (LTBI) among frail and older adults in long-term care facilities (LTCFs) is unknown, and likely varies greatly, depending on the patient population. Because the majority of tuberculosis (TB) cases in the United States are the result of remote infection (i.e., infection in the distant past), persons with LTBI represent a reservoir of persons in whom TB can be prevented. Among older adults, an estimated 90% of TB cases result from reactivation of LTBI acquired earlier in life, rather than as a result of recent transmission.[1, 2] Older adults are at highest risk because they are more likely to have been exposed to TB at some point during their lifetime. This increased risk results from more years during which exposure might have occurred and having lived through a time when TB was more common. Even as TB disease incidence rates have declined, the population with LTBI continues to grow.[3–5] In 2014, 2.2% of cases of TB disease were among persons diagnosed in LTCFs.[6] As the proportion of U.S. adults aged 65 years continues to expand, populations residing in long term care settings will include disproportionate numbers of persons both at risk for TB and for progression to active TB disease if LTBI is untreated.

Despite state and federal guidelines recommending LTBI testing for populations with a high risk for LTBI and TB transmission, including those living in LTCFs, Reddy and colleagues report that only 63% of residents in three inner-city LTCFs in the Boston area received LTBI testing despite those facilities serving a population at high risk (e.g., 48% with diabetes, 38% foreign-born, and 33% with chronic kidney disease).[7] Upon closer examination, one facility apparently accounted for the greatest proportion of missed testing opportunities, with only 28% of eligible residents tested; however, none of the three facilities had 100% testing

**Conflict of Interest Statement:** We declare no competing interests. The conclusions in this editorial are those of the authors and do not necessarily represent the views of the U.S. Centers for Disease Control and Prevention.

**Author Contributions:** Both authors contributed to the preparation of editorial response.

**Sponsor's Role:** None.

for eligible residents, even among residents staying 3 months or longer as recommended by Massachusetts TB guidance in effect at the time of that study.[7] This potential gap in LTBI detection is of particular concern, given that among persons with tuberculin skin test (TST) results, the prevalence of LTBI was 20%, including 8% with a new positive TST result documented during the current LTCF stay.[7] An additional 8% had documentation of a TST being performed, but no result was documented.[7] The variation in LTBI testing practices observed in this limited study should prompt providers and public health officials to evaluate LTBI testing practices in their own communities.

From Reddy's assessment, how LTCF residents with prior positive or new positive TST results were evaluated for TB is unclear, particularly among persons with a history of remote infection. Residents with a positive TST should have a medical examination, including chest radiograph, to rule out active TB before being offered LTBI treatment. Screening for LTBI requires complete evaluation for TB; if the evaluation results are positive for LTBI, patients should be referred for appropriate treatment. For residents with known positive results, documenting infection status also allows consideration of TB in differential diagnoses for patients who exhibit nonspecific TB symptoms (e.g., weight loss, cough, or fever). Reddy reports that four of 12 residents with newly documented positive LTBI test results during admission were offered LTBI treatment, of whom three completed therapy; however, no information was available for those with positive results before LTCF admission.[7] Facilities providing long-term care services need to have a process for follow-up of residents who are identified with LTBI. The need to develop an LTBI testing and treatment protocol should also be a consideration for other long-term care service providers, including adult day service centers, home health agencies, and assisted living communities, all of which provide care to an additional 7 million U.S. residents each year.[8]

Although the LTBI prevalence rates observed among residents admitted to the three participating facilities in Reddy's study might not be representative for all LTCFs nationally, changing demographics and increased comorbidities among residents might contribute to increased risk for TB disease in long-term care settings. The racial/ethnic diversity in LTCFs has been increasing, with the proportion of white, non-Hispanic residents having decreased from 84% in 2004 to 76% in 2014.[8–10] Frailty and care needs are also increasing, with 63% of persons requiring assistance with four or more daily living activities and 32% requiring assistance because of diabetes.[8, 10] Growth in the short-stay, recently hospitalized population has also contributed to the medical complexity of the LTCF population. As the medical complexity and comorbid conditions in these settings increase, so might the potential for development of active TB and outbreaks among residents. Outbreaks in LTCFs are associated with preventable transmission and mortality, and they necessitate extensive contact investigation efforts.[11–13]

With the availability of shorter course, better tolerated LTBI treatment regimens, opportunities for preventing TB disease and transmission among older adults are substantial. [14–16] However, prevention cannot be implemented if the population at risk is undetected. CDC and the U.S. Preventive Services Task Force recommend LTBI screening for asymptomatic adults at increased risk for TB, including those who have lived in countries with increased TB prevalence and those who live in or have lived in high-risk congregate

settings (e.g., homeless shelters, LTCFs, and correctional facilities).[17, 18] LCTFs and other long-term care service providers have an opportunity to contribute to TB elimination by implementing consistent LTBI testing for new admissions, evaluating persons with positive LTBI results for TB disease, and offering treatment and ongoing follow-up for treatment completion. Providers who take actions now to improve testing and treatment practices for LTBI among frail and older residents will have substantial impact on the morbidity and mortality experienced from active TB disease and unrecognized transmission potential among this vulnerable population.

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