

Should Family Physicians Routinely Screen for Lung Cancer in High-Risk Populations?

► See related U.S. Preventive Services Task Force Recommendation Statement at <http://www.aafp.org/afp/2014/0715/od1.html>, Putting Prevention into Practice on page 117, and POEM on page 112.

No: The USPSTF's Recommendation for Lung Cancer Screening Is Overreaching

DEAN A. SEEHUSEN, MD, MPH, *Fort Belvoir Community Hospital, Fort Belvoir, Virginia*

The U.S. Preventive Services Task Force (USPSTF) was premature in issuing a level B recommendation for annual computed tomography (CT)-based lung cancer screening.¹ This relatively aggressive stance is surprising because the USPSTF typically issues very measured recommendations when questions remain. There is still considerable uncertainty about the true magnitude of benefit from annual screening, as well as the financial and psychological costs; therefore, the scope of the recommendation should be limited to one of individualized, shared decision making.

This recommendation is based largely on the results of a single study, the National Lung Screening Trial (NLST).² Although the NLST was a large and well-conducted investigation, the participants were younger, more educated, and more likely to be current smokers than the general population.³ The population at greatest risk of lung cancer, those 70 years and older, comprised less than 9% of NLST participants.² From 2004 to 2006, more than one-half of lung cancer cases in the United States occurred in this population.⁴

The NLST investigators note that most CT scanners currently in use are of higher quality than those used in the study,² so it is likely that additional cancer diagnoses, incidental findings, and false-positive results will occur with newer technology. The NLST was conducted at centers with excellent radiologic and surgical services, but the general population may not have access to the same level of care.⁵ NLST participants received annual CT screening for just three years, then were followed



This is one in a series of pro/con editorials discussing controversial issues in family medicine.

► See related editorial at <http://www.aafp.org/afp/2014/0715/od2.html>.

clinically, whereas the USPSTF recommendations extend annual screening beyond the initial three years. Additional annual screening will detect more cancers, but will result in many more false-positive results.

The sum of these key differences is that the results of annual CT-based lung cancer screening will differ from the findings in the NLST. The magnitude of differences in patient characteristics, the sensitivity of equipment used, and the quality of clinical services in general practice will significantly affect the true benefit of screening.

The costs of the recommendations are also not fully understood. Although the USPSTF does not focus on the cost of preventive services, the health care system will be affected by the financial consequences of these recommendations. The cost of annual CT-based lung cancer screening has been estimated at \$725,000 per life saved in the NLST.⁶ In the study, there were 24 false-positive results for every true positive; the false-positive rate with newer technology could be higher. There may also be increased rates of complications from workups in an older and sicker general population. Obviously, many patients will get far more than three CT scans. All of these factors will likely drive the cost per life saved even higher.

Another concern is the psychological impact of such a screening strategy. In the NLST, nearly 39% of participants had an abnormal result on at least one of their first three annual screenings.² Short-term anxiety increases with

positive or indeterminate results.⁷ In the long term, there is the question of the psychological effects of incidental diagnoses, such as coronary artery disease or emphysema. Overdiagnosis of lung cancer causes significant psychological trauma. To date, no study has had a sufficient follow-up period to establish the rate of overdiagnosis from CT-based screening, although the USPSTF estimates the rate will be 9.5% to 11.9%.¹ A recent analysis of the NLST estimated that the overdiagnosis rate could be as high as 18.5%.⁸

The USPSTF recommendation on annual CT-based lung cancer screening should have been given a C grade for now, similar to that for mammography before 50 years of age. This would have encouraged physicians to individualize the decision, taking into account multiple considerations such as comorbid conditions, personal values, and local resources. This would closely parallel the current American Cancer Society recommendations for lung cancer screening.⁹ The American Academy of Family Physicians also took a more conservative stance in its recent conclusion that there is insufficient evidence for or against CT-based screening in high-risk persons.¹⁰

It is possible that the benefits observed in the NLST will not be replicated in the general population. Additional research needs to be conducted on the costs and benefits of the real-world implementation of these guidelines. An example is the recent development of a prediction model for screen-detected nodules that may allow fewer invasive evaluations.¹¹ The final analysis may show even greater benefit than that observed in the NLST, or the scales could tip in the opposite direction. The USPSTF should be prepared to closely scrutinize these results and reverse course, if necessary.

The views expressed in this article are those of the author and do not reflect the official policy or position of the U.S. Army or Department of Defense.

Address correspondence to Dean A. Seehusen, MD, MPH, at dseehusen@msn.com. Reprints are not available from the author.

Author disclosure: No relevant financial affiliations.

REFERENCES

1. Moyer VA. Screening for lung cancer: U.S. Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2014;160(5):330-338.
2. Aberle DR, Adams AM, Berg CD, et al.; National Lung Screening Trial Research Team. Reduced lung-cancer mortality with low-dose computed tomographic screening. *N Engl J Med*. 2011;365(5):395-409.
3. Aberle DR, Adams AM, Berg CD, et al.; National Lung Screening Trial Research Team. Baseline characteristics of participants in the randomized National Lung Screening Trial [published correction appears in *J Natl Cancer Inst*. 2011;103(20):1560]. *J Natl Cancer Inst*. 2010;102(23):1771-1779.
4. Underwood JM, Townsend JS, Tai E, et al. Racial and regional disparities in lung cancer incidence. *Cancer*. 2012;118(7):1910-1918.
5. Heuvers ME, Wisnivesky J, Stricker BH, Aerts JG. Generalizability of results from the National Lung Screening Trial. *Eur J Epidemiol*. 2012;27(9):669-672.
6. Kohn MA. Reduced lung-cancer mortality with CT screening. *N Engl J Med*. 2011;365(21):2036-2037.
7. Humphrey LL, Deffebach M, Pappas M, et al. Screening for lung cancer with low-dose computed tomography: a systematic review to update the US Preventive Services Task Force recommendation. *Ann Intern Med*. 2013; 159(6):411-420.
8. Patz EF Jr, Pinsky P, Gatsonis C, et al.; NLST Overdiagnosis Manuscript Writing Team. Overdiagnosis in low-dose computed tomography screening for lung cancer. *JAMA Intern Med*. 2014;174(2):269-274.
9. Wender R, Fontham ET, Barrera E Jr, et al. American Cancer Society lung cancer screening guidelines. *CA Cancer J Clin*. 2013;63(2):107-117.
10. American Academy of Family Physicians. Clinical recommendations. Lung cancer. <http://www.aafp.org/patient-care/clinical-recommendations/all/lung-cancer.html>. Accessed May 3, 2014.
11. McWilliams A, Tammemagi MC, Mayo JR, et al. Probability of cancer in pulmonary nodules detected on first screening CT. *N Engl J Med*. 2013;369(10):910-919. ■