

Screening for Lung Cancer: Moving Into a New Era

This issue of *Annals* includes the most recent U.S. Preventive Services Task Force (USPSTF) recommendations on screening for lung cancer (1), an important paper because of the findings and because lung cancer causes as many deaths in the United States as the next 3 leading types of cancer combined (all of which already have screening interventions). The USPSTF concluded that deaths due to lung cancer are significantly reduced by low-dose computed tomography (CT) screening in healthy individuals with an elevated risk for lung cancer (specifically adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years). The USPSTF emphasizes careful patient selection and not screening patients with lower risk or comorbid conditions that limit life expectancy or suitability for resection. The accuracy of image interpretation should be similar to that in the NLST (National Lung Screening Trial), and most false-positive results should be resolved without invasive procedures. The USPSTF advocates for screening in organized programs with a discussion of benefits and harms; smoking cessation counseling for active smokers; a standardized approach to scanning, image interpretation, and ensuring follow-up; adherence to quality standards; participation in a registry; and validation of whether broad implementation of CT screening achieves results similar to those of the NLST. In other words, the USPSTF recommends a structured screening process, not simply a scan.

The USPSTF report does not address many practical aspects of implementing lung cancer screening. Screening disproportionately attracts individuals who have great anxiety about developing lung cancer even though their risk is actually not so high. These people need reassurance, with discussion of their risk for lung cancer and the issues associated with screening as they apply to them. This substantial population exists despite being outside the focus of the USPSTF report (that is, those appropriate for screening). These people have reasons for their concerns: Turning them away because they do not meet the criteria does not provide them the reassurance they seek. They usually respond well to an educated discussion of screening and their risk for lung cancer, but this requires specialized knowledge and time. It is easier to give in and screen an anxious patient who does not meet the defined criteria. However, chest CT—which is notorious for false-positive findings—is not a simple way to provide reassurance to anxious, lower-risk individuals.

How patient selection actually occurs is worth careful consideration because ample evidence shows underuse of cancer screening in populations for which it is indicated and overuse in those for which it is not (2–4). It is one thing to have strict criteria for entry into a study and no data that lung cancer screening works; it is another to ar-

gue that we should be screening and then expect that individuals with concerns can be excluded by simply drawing a line. For example, we can consider magnetic resonance imaging for breast cancer screening as being similar to CT for lung cancer screening: It is a recent development, uses technologically advanced imaging, and has specific guidelines for use that involve risk assessment. Recent studies have found that only about 25% of women having a screening magnetic resonance imaging scan meet guideline criteria (2, 3). We should use such insights to guide optimum implementation of lung cancer screening.

Effective implementation of lung cancer screening hinges on reaching high-risk individuals; studies show that those at higher risk (smokers) are less interested in being screened despite recognizing that they are at risk (5). Another issue, as seen in studies of adherence to colon cancer screening (6), is whether we can achieve adequate adherence and follow-up in persons who are at highest risk for lung cancer. It is unlikely that sporadic CT screening will achieve results identical to those seen in the NLST (where adherence was 95%) (7).

The USPSTF does not address who will evaluate people who are interested in or should consider CT screening for lung cancer. Traditionally, screening has been the task of primary care physicians—but how well will this work? Lung cancer differs from other types of cancer: Screening is new, the prognosis is particularly grim compared with other cancer types for which screening is recommended, and the risk is highly variable and complex. Do primary care physicians have the knowledge, skills, and time to advise patients on lung cancer screening? If not, how do we provide them with the knowledge and tools they need? Are there other providers who are up to the task (for example, radiologists, pulmonologists, or nurse practitioners)? We need to develop this workforce to optimally implement lung cancer screening.

Is the health care system willing to support what the USPSTF is recommending? Are we willing to provide the resources to make the process of patient selection and counseling achievable and to make contribution to a registry and tracking of quality metrics actually happen? The USPSTF recommendation involves more than performing a scan and having a radiologist interpret it.

Many fundamental questions remain. What is the natural history of screen-detected cancer cases? Are there criteria for whom and when to treat? What is the most effective therapy? The Cancer Intervention and Surveillance Modeling Network model (8) that informed the recommendations includes assumptions that are unlikely to occur in actual implementation (for example, 100% adherence to screening and additional imaging and biopsy rates equal to those of the NLST). This is a dynamic field, and refinements in screening models could become available quickly.

We should learn from differences among the randomized lung cancer screening trials; results from several of these will become available in the next few years, and the results from trials already available do not fall exactly in line with those of the NLST. **If we stray too far from what we confidently know, we risk facing the difficult task of undoing mistakes.** We need to implement screening given the evidence that we have, but we should proceed in a stepwise fashion. To paraphrase Winston Churchill, “This is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning [of screening for lung cancer].”

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