

TEACHABLE
MOMENT

LESS IS MORE

Competing Mortality in Cancer Screening
A Teachable Moment**Daniel Schneider, MD, PhD**

Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, University of Michigan Medical School, Ann Arbor.

Douglas Arenberg, MD

Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, University of Michigan Medical School, Ann Arbor.



Editorial

Story From the Front Lines

A 70-year-old man saw his primary care clinician and expressed concern about his lung cancer risk after learning a friend had recently died of it. The patient had had an 80-pack-year history, and had quit 7 years previously. His physician ordered a screening chest computed tomographic (CT) scan, which demonstrated a spiculated 12-mm lung nodule that was new when compared with scans done previously for other reasons. This prompted a positron emission tomographic scan, which showed metabolic activity, raising the suspicion for lung cancer. He was referred to a pulmonary-nodule clinic.

The man presented to the pulmonary clinic in a wheelchair while receiving continuous oxygen. His medical history revealed severe diastolic heart failure; chronic obstructive pulmonary disease; obesity (his body mass index, calculated as weight in kilograms divided by height in meters squared, was 54); diabetes mellitus with microvascular complications, including stage III chronic kidney disease; and peripheral neuropathy. Additional medical history included several recent falls attributed to progressive neuropathy and deconditioning. These considerations were discussed with the patient and ultimately, invasive diagnostic testing was discouraged. A conservative plan that included a repeated CT scan in 4 months was mutually agreed on. Two months after this visit, the patient was admitted and treated for pneumonia. While recovering in the hospital, his primary team noted that this nodule had not undergone workup and he had another CT scan, which demonstrated interval growth. He was scheduled for an outpatient CT-guided biopsy.

Prior to the biopsy, the patient was rehospitalized for pneumonia, this time requiring intensive care unit admission. His medical history was addressed at a multidisciplinary thoracic tumor conference. He was not a surgical candidate, and attempts to biopsy the nodule were also considered to be high risk. Therefore, he was referred to radiation oncology to discuss the risks and benefits of empirical radiation therapy without a tissue diagnosis. Prior to meeting with radiation oncology, in follow-up at an outpatient clinic 2 weeks after discharge, he had increasing dyspnea, was delirious, and was thought to yet again have pneumonia. He was ultimately referred to palliative care for consideration of hospice.

Teachable Moment

Common cautions in the context of screening for lung cancer include high false-positive rates, complications of invasive procedures, radiation exposure, and psychological stress. Other considerations, which this pa-

tient's case illustrates, are the importance of considering competing mortality when assessing the potential benefits of screening and overdiagnosis. The US Preventive Services Task Force clearly emphasizes this in their recently released guideline statement: "Screening may not be appropriate for patients with ... comorbid conditions, particularly those who are in the upper end of the screening age range."^{1,2} In other words, screening should be restricted to those whose health permits them to benefit from and tolerate the additional testing and treatment required.

This is also reflected in the "shared decision making" requirement of the Centers for Medicare and Medicaid Services decision³ to cover lung cancer screening for high-risk Medicare beneficiaries. This emphasizes the idea of targeting screening based on patient comorbidities and individualized preferences. Physicians should resist the temptation and not feel obliged to offer screening to patients only because they meet age and smoking requirements. Rather, as this case illustrates, physicians will be doing a disservice to patients and the health care system if they offer screening to patients that will not benefit.

As screening for lung cancer is implemented in a wider population, we can expect screening subjects who are sicker than the National Lung Cancer Screening Trial participants and arguably sicker than the populations offered other cancer screening interventions owing to targeting patients with considerable smoking history. We can also expect a reduction in overall benefit as follow-up compliance inevitably regresses away from the 95% adherence attained in a clinical trial. This stresses the importance of careful selection of patients who are likely to benefit from intervention.

Overdiagnosis is related to competing mortality, in that it represents the detection of clinically insignificant cancers. This determination varies from patient to patient because those with lower life expectancy have a greater chance of experiencing "overdiagnosis" during cancer screening. Both retrospective studies^{4,5} of actual practice patterns and survey data confirm that screening for cancer is offered to patients with limited life expectancy and therefore limited potential to benefit from screening. Recognizing the impact of comorbid illness on the effectiveness of cancer screening is arguably more important in the patient population eligible for lung cancer screening owing to a high prevalence of smoking-related comorbidities.

As lung cancer screening is more widely adopted, considerations of comorbid disease must be incorporated into shared decision-making, and decision aids that

Corresponding

Author: Douglas Arenberg, MD, Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, University of Michigan Medical School, 1150 W Medical Center Dr, 6301 MSRB III SPC 5642, Ann Arbor, MI 48109 (darenber@umich.edu).

facilitate this might prove very useful. In our patient, it was hard to predict his accelerated decline but comparatively very easy to pre-

dict that, if a screen-detected cancer was present, he would die with it, not as a result of it.

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