Model Tackles Benefits and Costs of Annual Low-Dose CT Lung Cancer Screening in Medicare Program

BY MARK FUERST

A nationwide low-dose computed tomography (LDCT) lung cancer Medicare screening program will identify more and earlier-stage lung cancers, but will come with substantial Medicare costs, according to data reported at the ASCO Annual Meeting (***Abstract 6501***).

As described in a pre-meeting news briefing "presscast" for the media, a model was used to project five-year outcomes to implement the U.S. Preventive Services Task Force recommendations for annual LDCT lung cancer screening in a high-risk Medicare population. The model estimates that gradual implementation of the screening program would result in nearly 55,000 more lung cancer cases detected over a five-year period, a large majority of which would be early-stage disease.

"If we can diagnose lung cancers at an earlier stage, patients can be treated far more effectively, and survival prognosis is much better," said the researcher who presented the study, Joshua A. Roth, PhD, MHA, a postdoctoral research fellow at Fred Hutchinson Cancer Research Center. "However, the key to the success of this screening program is ensuring that those who are at high risk actually undergo screening and subsequently receive appropriate treatment."

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First Such Study

He noted that this is the first such study looking specifically at the Medicare population, which has the highest lung cancer incidence and a large proportion of members who qualify for screening.

Asked for his opinion for this article, Tawee Tanvetyanon, MD, Associate Member of the Thoracic Head & Neck Oncology Department at Moffitt Cancer Center, said, "Lung cancer screening will be able to change the course of disease in patients. Instead of their being diagnosed with metastatic disease, we can now pick up the disease earlier and address it with surgery, which is less expensive than the cost of chemotherapy. Surgery cures early-stage lung cancer, and gives patients a good quality of life compared with the side effects associated with chemotherapy for advanced-stage disease."

The Task Force recommendations are largely based on the findings from the National Lung Screening Trial (NLST) of approximately 53,000 participants age 55 to 74, randomized to receive either three years of screening with LDCT or chest x-ray. Over six and a half years of follow-up, lung cancer mortality was reduced by 20 percent in the LDCT group.

Annual screening is recommended for people age 55 to 80 who have a 30 pack-year smoking history who currently smoke or who have quit within the past 15 years.

"We assumed gradual diffusion of LDCT screening, much like the experience with mammography," Roth said. "Compared with a no-screening strategy, the five-year expected impacts of LDCT screening are 54,900 more lung cancer diagnoses—mostly Stage I—11.2 million more LDCT scans—including two million false-positives—$5.6 billion more in LDCT imaging expenditures, $1.1 billion more in diagnostic workup expenditures, and $2.6 billion more in cancer care expenditures."

To project the five-year clinical, resource, and budget impacts of implementing LDCT lung cancer screening in Medicare, the researchers used a forecasting model to project outcomes of an LDCT screening strategy versus a no-screening strategy. The patient population was Medicare enrollees. Data sources included the NLST, the National Cancer Institute's Statistics Epidemiology and End Results (SEER) data, and peer-reviewed literature. Outcomes were lung cancer cases diagnosed (by stage), LDCT scans, false-positive screening results, and direct medical expenditure.

He explained that the model assumes that, over a five-year period, an additional 20 percent of high-risk patients would be offered screening each year. Because the rate of screening use has the greatest influence on clinical, resource, and budget outcomes, the researchers considered three different screening use scenarios for the implementation—an expected-use scenario based on historic experience with mammography (50 percent of patients who are offered screening undergo screening every year), a low-use scenario (25 percent of patients who are offered screening undergo screening every year), and a high-use scenario (75 percent of patients who are offered screening undergo screening every year).

Although the high-screening use scenario would detect the most lung cancer cases at an early stage, it may not be feasible given the resources—staff, technical, financial, and patient education—required, the researchers concluded.

The total five-year Medicare expenditure for LDCT imaging, diagnostic workup, and cancer care would be $9.3 billion, which amounts to a $3.00 per month premium increase per Medicare member. In the low- and high-screening use scenarios, the total five-year Medicare expenditure would be $5.9 billion and $12.7 billion, or a $1.90 and $4.10 monthly premium increase per Medicare member, respectively.

Roth and his colleagues are now planning future analyses that will assess and consider available resources and demand for additional scanners and technologists—analyses that will help health care systems adequately prepare for the implementation of the Task Force screening policy.

Still Controversial

Lung cancer screening continues to be controversial. About a month ago, in direct opposition to the Task Force, the Medicare Evidence Development and Coverage Advisory Committee (MEDCAC) recommended against Medicare covering lung cancer screening in high-risk individuals. Under the Affordable Care Act (ACA), medical exams receiving a grade "B" (moderate) or higher from the Task Force must be covered by private insurers without a copay. Lung screening received a "B" rating.

The ACA, however, does not stipulate that Medicare must follow the Task Force rating. If the Centers for Medicare and Medicaid Services follow the MEDCAC recommendation, this would create a screening disparity between Medicare beneficiaries and those who are privately insured. A draft decision on Medicare coverage is expected to be released in November, Roth noted.

Summing Up

Summing up, he said, "over a five-year period, we project that LDCT lung cancer screening in Medicare will result in 54,900 more lung cancers detected, 32 percent of lung cancers

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detected at localized stage—versus 15 percent currently—40 percent of lung cancers detected at distant stage—versus 57 percent now—and $9.3 billion more in expenditure—primarily on LDCT scans.

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> "We project that over a five-year period, LDCT lung cancer screening in Medicare will result in: 54,900 more lung cancers detected; 32% of lung cancers detected at a localized stage vs. 15% now; 40% of lung cancers detected at a distant stage vs. 57% now; and $9.3 billion more in costs."

Commenting during the presscast, ASCO 2013-1014 President Clifford A. Hudis, MD, Chief of the Breast Cancer Medicine Service at Memorial Sloan Kettering Cancer Center, said, "Tobacco use continues to contribute far too much to the nation's cancer burden. While low-dose CT screening offers a long-awaited early lung cancer detection strategy, as doctors we must do everything possible to provide patients with the encouragement and resources they need to stop smoking, and prevent the next generation of young adults from starting."

Worth It?

In response to a question, Roth noted that the model did not include a cost-effectiveness analysis: "There is this open question of value, and this study did not directly address that. We're really trying to forecast what will happen as far as clinical resource use and budget impact if this policy is implemented," he said.

Hudis said the value of this research and lung cancer screening in general "is a societal question—What we can provide and what Dr. Roth and his group have provided is an estimation of the expense side that bounces against the measurable concrete gains that we would hope to see. But the question of 'What is this worth?' is one that I think we have to engage with the policymakers, regulators, and others in order to arrive at a decision."

ASCO guidelines support the Task Force recommendations on screening, Hudis noted. Still, "this is a model, not actual data. It makes assumptions. Historically, this is similar to when mammography was rolled out. It will be interesting to see the real numbers we get in the future."

Tanvetyanon said that if the calculations are correct according to the prediction, the slight increase in Medicare costs would be worth it: "The goal of health care is to save lives and enhance longevity. This program is able to save lives. There is no reason why it wouldn't be justified."

He noted that there was a time when the economic impact of Medicare approval of dialysis was also a concern, but dialysis has proven to improve patients' quality of life and has saved lives. "This new technology for lung cancer screening comes out at a time when people do not want to hear more about medical costs. But cost should be secondary."

The study does have limitations: "It's just a mathematical model. We need to also factor in the cost of care of patients with metastatic disease, which can be very expensive," Tanvetyanon said.

In general, research on the cost-effectiveness of pricy drugs includes an analysis of quality-adjusted life years, which this study did not do.

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Another concern raised by the advisory panel was the ability of screening centers to adhere to the diagnostic workup standard of a clinical trial. Some patients may be harmed because of excess diagnostic workups of benign lung abnormalities. "It will take a center with some familiarity with benign disease to limit the number of biopsies," Tanvetyanon said. "False positives need to be dealt with in a logical, appropriate manner. We have guidelines to make sure we get the same results outside of a clinical trial protocol."

Patient Education

To get more patients to go for lung cancer screening will require more awareness of the new screening technique. "Many patients do not know that they fit the criteria to be screened," he said.

> "The question of 'What is this worth?' is one that we have to engage in with policymakers, regulators, and others in order to arrive at a decision."

Tanvetyanon's message to practicing oncologists: "In the near future, more patients will be referred to you with abnormal CT screening with suspicions of lung cancer. Keep up to date on how to manage abnormal lung nodules, and keep referral sources for additional diagnostic workups handy."

And even if Medicare decides against paying for lung CT screening, this is an increasing industry trend, he said. Several health insurance carriers have started to pay for lung CT screening among those age 55 to 80 who have been heavy smokers or continue to smoke.