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After Landmark Study, Exploring Questions about Lung Cancer Screening

Two years ago, NCI released initial results from the National Lung Screening Trial (NLST), which showed, for the first time, that a screening test could potentially reduce the number of deaths from lung cancer among current or former heavy smokers.

NLST used low-dose helical CT scanners like this one to screen for lung cancer.

The lung cancer screening study, which enrolled more than 53,000 current or former heavy smokers, found that a 20 percent relative reduction in deaths from lung cancer occurred among participants screened with low-dose helical computed tomography (helical CT) compared with those screened with standard chest x-rays. (This means about a 0.3 to 0.4 percent absolute reduction in deaths at about 6.5 years.)

The release of the NLST findings caused “a huge resurgence in interest in lung cancer screening and a great excitement about the possibility of using it to prevent deaths from the disease,” noted Dr. David A. Lynch, pulmonary radiologist at the National Jewish Health hospital in Denver.

But despite the enthusiasm about the results, some researchers caution that more research is needed before lung cancer screening with helical CT is widely used. Since the results were released in November 2010, only a handful of U.S. clinicians and medical centers have adopted the screening method and the patient selection and evaluation criteria used in NLST. Additional studies are under way to better understand just how the NLST results should be interpreted and applied in everyday practice.

Cautious Pace of Adoption

Despite the benefits of lung cancer screening with low-dose CT scans, the NLST findings came with some caveats.

“A critical issue is to whom lung cancer screening should be offered,” commented Dr. Christine Berg, NCI project officer for NLST. The NLST researchers can generalize the results only to the population that participated in the trial: current or former smokers (defined as having quit within 15 years of joining the trial) aged 55 through 74 who smoked the equivalent of at least a pack a day for 30 years.

But, Dr. Berg added, “NCI is involved with a number of research studies to better define high-risk groups that could benefit from lung cancer screening. It is also critically important to define groups that are at very low risk, such as never smokers, even if they’ve been exposed to secondhand smoke. They remain at such a low risk for lung cancer that the harm-benefit ratio is not in favor of screening.”

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—Dr. Linda Kinsinger

Those potential harms of lung cancer screening are another concern that needs to be addressed. Nearly 25 percent of all CT scans in NLST showed false-positive results, meaning that on follow-up 1 in 4 observed abnormalities turned out not to be cancer. In addition to suffering unnecessary anxiety, these patients underwent some kind of additional diagnostic procedure, some of which carry risks. The high false-positive rate raises questions about how to follow up when a nodule is found.

“In my medical center’s practice, we find the main thing that physicians need help with is nodule management,” when abnormalities are detected on the CT scan, said Dr. Lynch. “That remains their biggest concern: what to do about those findings?” he added.

National Jewish Health hospital responded by developing a multidisciplinary approach that “automates tracking of lung nodules and ensures that follow up is performed,” he said. Comprehensive lung cancer screening initiatives at other institutions should include such support, as well as effective smoking cessation programs, Dr. Lynch recommended.

Another barrier to wider use of screening for lung cancer so far has been lack of insurance coverage, noted Dr. Paul Kvale, pulmonologist at Henry Ford Hospital in Detroit. “Until now, most insurance carriers have not agreed to cover low-dose CT scans for their subscribers for purely screening purposes.”

Guidelines and Recommendations Expected Soon

Dr. Kvale believes this lack of coverage will change in the next year or so if medical societies and government agencies recommend the adoption of lung cancer screening, citing NLST findings. He is working on such guidelines with the American College of Chest Physicians (ACCP) that he hopes will be published in early 2013.

Lung cancer screening recommendations are also expected soon from the U.S. Preventive Services Task Force (USPSTF). NCI’s Cancer Intervention and Surveillance Modeling Network (CISNET) is working to provide modeling analysis of NLST findings, as well as of the findings from the Prostate, Lung, Colorectal and Ovarian Cancer Screening Trial (PLCO), to inform the USPSTF recommendations, reported CISNET Principal Investigator Dr. Pamela McMahon.

“We’re working on basically triangulating between the NLST results—which had a CT arm and a

chest x-ray arm—and the PLCO results, which had a chest x-ray arm and a no-screening arm, and also many lighter smokers, nonsmokers, and even never smokers," Dr. McMahon explained.

Dr. Berg believes the CISNET analysis will provide important information and guidance on optimal methods for lung cancer screening "in terms of screening intervals, how long to continue screening, when to start screening," and impact of smoking history, all aimed at balancing the harms and benefits of screening for high-risk individuals.

Testing Lung Cancer Screening in the Real World

In anticipation of the USPSTF recommendations, the U.S. Veterans Health Administration's (VHA) National Center for Health Promotion and Disease Prevention is planning to conduct a lung cancer screening pilot program, based on the NLST findings, at six to eight VHA medical centers starting early next year.

"The goal of the pilot will be to gather information that will inform how this procedure would work in the VHA system," explained Dr. Linda Kinsinger, chief consultant for preventive medicine at VHA. "We were impressed with the results of the NLST—a 20 percent reduction in lung cancer mortality is a finding that we didn't feel could be ignored," she added. "On the other hand, we also felt that there were still lots of questions about how to do screening and whether we could achieve that same result in a real-world setting compared with a research setting.

"We're not ready to strongly endorse lung cancer screening to our patients just yet," Dr. Kinsinger continued. "Rather, during the pilot program, we plan to give people the right information, let them make their choices, and see how that works within our system."

—*Bill Robinson*