

Lung cancer screening with low dose computed tomography (LDCT): looking back and moving forward

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The last 5 years have been a busy time for lung cancer screening. In 2010, results from the National Lung Screening Trial were announced: the trial demonstrated that annual screening with low dose computed tomography (LDCT) led to a 20% reduction in lung cancer mortality for individuals aged 55 to 74 years who had a smoking history of at least 30 pack-years, and if former smokers, had quit within 15 years of enrollment (1). And in 2011, the Prostate, Lung, Colorectal, and Ovarian (PLCO) Cancer Screening Trial reported no reduction in lung cancer mortality with annual single view chest X-ray screening in either ever or never smokers (2). The results of the trials are generally accepted to have definitively answered two questions that had the subject of much debate over the years. When it comes to lung cancer screening, chest X-ray doesn't work, but LDCT does.

The knowledge that LDCT screening reduced lung cancer mortality led to many discussions about how best to implement the practice in community settings. Some suggested that screening should be expanded to include those who were younger or smoked fewer pack-years than the NLST participants. Others questioned whether non-academic centers would be able to provide appropriate medical care for those who received screens that were suspicious for lung cancer. The concern of excessive radiation exposure was raised, as was the concern that current smokers would view screening as negating the need to quit.

At the end of 2013, the United States Preventive Services Task Force announced its recommendation regarding lung cancer screening with LDCT (3). The Task Force assigned a "B," stating:

"The USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in

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. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery."

In February, 2015, the US Centers for Medicare and Medicare services announced that Medicare would immediately cover lung cancer screening with LDCT once per year for its beneficiaries if:

- "They are age 55-77, and are either current smokers or have quit smoking within the last 15 years;
- They have a tobacco smoking history of at least 30 "pack years" (an average of one pack a day for 30 years);
- They receive a written order from a physician or qualified non-physician practitioner that meets certain requirements." (4).

Those two decisions are expected to lead to rapid expansion of LDCT screening in the United States. The American College of Radiology (ACR), a firm supporter of lung cancer screening with LDCT, has and will continue to work toward what they believe to be appropriate community implementation. They have developed a program to allow screening centers to apply for the designation of an ACR Lung Cancer Screening Center. The requirements for designation were recently published in the Journal of the American College of Radiology by Kazerooni *et al.* (5). Kazerooni *et al.* begin their article by reiterating the ACR belief that the ability to effect a lung cancer mortality reduction in a community setting depends on "appropriate patient selection, the performance of high-quality, low-radiation exposure LDCT examinations interpreted

by qualified physicians, and a structured reporting and management system as the foundation for quality reporting and outcomes monitoring”.

The first step in receiving the lung cancer screening center designation is to obtain ACR CT accreditation (6). Over 6,500 radiology facilities already have this accreditation, which indicates that the facility has met ACR standards for personnel qualification, quality assurance, quality control, and image quality. Facilities also must submit clinical exams, phantom images, and radiation dose information for review when applying for the accreditation. Accreditation is granted to those facilities that meet all conditions and is granted for 3 years. Facilities are subject to random audit during the three year period, and re-accreditation requires reconsideration of all conditions.

To receive a lung cancer screening center designation, a facility must also attest to seven statements that concern the implementation of screening and related aspects (5). They must attest to statements regarding the lung cancer risk profile of persons they screen, experience of the interpreting physician, procedures for results reporting and referral when necessary, procedures for dissemination of smoking cessation information to current smokers who are screened, equipment requirements, quality control, and imaging protocol.

The exact attestation statements can be found in appendix 2 of the Kazerooni paper. Some of the statements are open to interpretation: for example, the facility must attest that the “majority” of their screenies are between ages 55 and 80. Others leave room for professional judgment, such as those that require changing of machine settings for smaller- or larger-than-average patients. Of use, especially during the first few years of the designation program, would be random audits of lung cancer screening practices; they could be done in conjunction with the CT accreditation random audits.

ACR’s lung cancer screening designation is a step in providing structure for lung cancer LDCT screening in

community settings. The designation will allow physicians and consumers to identify locations that have been deemed by the ACR as appropriate places to receive screening. I look forward to future reports that describe the experiences of these designated centers and, I hope, their success.

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