

CT Detects Twice as Many Lung Cancers as X-Ray at Initial Screening Exam

American College of Radiology

Investigators say 20 percent lung cancer mortality reduction previously reported in the NLST is achievable at centers in the US

National Lung Screening Trial (NLST) investigators also conclude that the 20 percent reduction in lung cancer mortality with low-dose computed tomography (LDCT) versus chest X-ray (CXR) screening previously reported in the NLST primary paper is achievable at experienced screening centers in the United States.

Physicians have more information to share with their patients about the benefits and risks of LDCT lung cancer screening following today's publication in the *New England Journal of Medicine* of the results of the first (of three planned) annual screening examinations from the NLST. "For a cancer screening to work, it's important to verify that it can in fact discover cancers early. The analysis of NLST participants' initial annual screening examination provides evidence that the number of early-stage cancers detected in the trial's CT arm were significantly greater than the number detected in the chest X-ray arm," says Timothy Church, Ph.D., a biostatistician and professor in the School of Public Health at the University of Minnesota who has been involved with the NLST's design, implementation and analysis. Church also points out that a reduction in mortality is the ultimate indicator of a successful cancer screening strategy. The NLST is a large-scale, longitudinal clinical trial that randomized over 53,400 study participants equally into either the LDCT or standard CXR arm to evaluate whether lung cancer screening saves lives. Published results (*NEJM*; 2011) reported a 20 percent reduction in lung cancer deaths among study participants (all at high risk for the disease) screened with LDCT versus those screened with CXR.

The authors report that the NLST initial-screening results are reflective of other large trials with regard to positive LDCT versus CXR results, with more positive screening exams [7191 vs. 2387, respectively], more diagnostic procedures [6369 vs. 2176, respectively], more biopsies and other invasive procedures [297 vs. 121, respectively], and more lung cancers seen in the LDCT arm than in the CXR arm during the first screening round of NLST [292 vs. 190, respectively]. Although these results were generally anticipated, a key reason to publish the data was to document the exact differences between the two arms. "Although we did see that CT resulted in referring more patients for additional testing, the question comes down to whether the 20 percent reduction in mortality is worth the additional morbidity introduced by screening high-risk patients," says Church. He notes that although there were more follow-up procedures in the LDCT versus the CXR arm, it was encouraging to confirm that the number of individuals who actually had a more invasive follow-up procedure was quite small.

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Published on Medical Design Technology (<http://www.mdtmag.com>)

Another encouraging result reported is the high rate of compliance in performing the LDCT examination as specified in the research protocol across the 33 imaging facilities that carried out the study. "The sites complied with the low-dose CT imaging protocol specifications in 98.5 percent of all studies performed, which is outstanding considering the many thousands of scans performed," states Denise R. Aberle, M.D., the national principal investigator for NLST ACRIN and site co-principal investigator for the UCLA NLST team. Aberle, a member of the UCLA Jonsson Comprehensive Cancer Center, professor of Radiology and Bioengineering and vice chair for Research in Radiology at UCLA, also emphasizes that the first-screen result strongly suggests that CT lung cancer screening programs with radiologists who possess similar expertise and interpret similar numbers of CT cases that are obtained on scanners of the same caliber or better as those required for the NLST are likely to have results similar to those reported in the paper.

"What we've learned from the analysis of the first-screen results provides clinicians additional facts to discuss with patients who share similar characteristics as the NLST participants (current or former heavy smokers over the age of 55)", says Church. "The results also caution against making blanket lung cancer screening recommendations, because each person's trade-off between the risk of having an unnecessary procedure and the fear of dying of lung cancer is uniquely individual."

"Today's publication represents the type of immensely important data NLST will continue to provide about lung cancer screening in the United States," says Mitchell J. Schnall, M.D., Ph.D., ACRIN Network Chair, group co-chair of the ECOG-ACRIN Cancer Research Group and chair of the Radiology Department of the University of Pennsylvania. "I congratulate the NLST team on its ongoing effort to continue to mine information from the NLST trial to help guide patient, clinician and health care policy decisions."

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