Screening for asbestos-related lung cancer

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There was no direct recommendation for lung cancer screening

“Further studies on the effectiveness of screening programs are needed.”
Emphasized the limitations of chest x-ray surveillance for lung cancer, other than “Occasionally, a few early-stage lung cancers are also found.”

The value of spiral CT is sufficiently compelling that clinicians and others should consider its use for case evaluation and the clinical management of those at high risk of lung cancer.
Subject areas to be updated

• CT screening for asbestos-related lung cancer
• Diagnostics and follow-up of asbestos-related diseases
• New asbestos-related disease entities
• Pathology and biomarkers
Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening

The National Lung Screening Trial Research Team

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ABSTRACT

The aggressive and heterogeneous nature of lung cancer has thwarted efforts to reduce mortality from this cancer through the use of screening. The advent of low-dose computed tomography (LDCT) altered the landscape of lung-cancer screening, with studies indicating that LDCT can reduce mortality from lung cancer. The National Lung Screening Trial (NLST) was conducted to determine whether screening with LDCT could reduce mortality from lung cancer.

METHODS

From August 2001 through April 2004, we enrolled 51,454 persons at high risk for lung cancer at 32 U.S. medical centers. Participants were randomly assigned to undergo chest annual screenings with either low-dose CT (20/20 participants) or single-view posterior-anterior chest radiography (30,322). Examiners collected cases of lung cancer and deaths from lung cancer through December 31, 2006.

RESULTS

The rate of adherence to screening was more than 90%. The rate of positive screening tests was 23% with low-dose CT and 6.9% with radiography over all three rounds. A total of 7% of the positive screening results in the low-dose CT group and 14.7% in the radiography group were false positive results. The incidence of lung cancer was 2.0% per 10,000 person-years (209 cases) in the low-dose CT group, as compared with 2.7% cases per 10,000 person-years (294 cancer cases in the radiography group) and 3.5% (294 persons with 3.5% of the radiography group and 3.2% of the radiography group). There were 2.4% deaths from lung cancer per 100,000 person-years in the low-dose CT group and 3.9% deaths per 100,000 person-years in the radiography group, representing a relative reduction in mortality from lung cancer with low-dose CT screening of 20% (95% CI, 1.4 to 2.8). The rate of death from any cause was reduced in the low-dose CT group, as compared with the radiography group, by 6.7% (95% CI, 1.3 to 13.6; P=0.02).

The National Cancer Institute's Lung Cancer Screening Trial: Laboratory study


- **Recommendations for lung cancer screening (mostly US)**
- **Largely following NLST in-/exclusion criteria (age 55-74; ≥ 30 pack years, ≤ 15 years since smoking cessation)**

There were **20% fewer lung cancer deaths** in the LDCT arm compared with the CXR arm.

There were **6.7% fewer deaths from all causes** in the LDCT arm compared with the CXR arm.
European Randomized Controlled Trials

- 6 ongoing trials which have enrolled 32,000 people
- ~ 150,000 person-years of FU
- UKLS trial has started (4,000)
- NELSON final results (mortality data) 2015

-> Lung Cancer Screening Guidelines are likely to evolve over time
Generalizability of NLST results?

• The asbestos-exposed cohort is aging - the window of opportunity to reduce premature deaths is now
• Waiting for RCTs with focus on asbestos-defined high risk groups would mean lost time and opportunity
• Generalizability of NLST results to other high risk group?
• Heavy smokers may have other smoking-related diseases that could negatively impact on outcome, eg COPD, CVD
• Heavy asbestos exposures can result in asbestosis, pleural plaques, mesothelioma, with negative impact on outcomes
• More open questions for optimization of screening of asbestos exposed subjects: lung cancer risk after cessation of exposure, screening interval, etc
Studies of Lung Cancer Screening in Asbestos Exposed Workers

• Published articles of asbestos-exposed persons typically:
  – Are case series
  – Have limited number of subjects
  – Have no control groups
  – Have little follow-up data on mortality

• They provide only inferential evidence about the efficacy of lung cancer screening in adults with a history of asbestos exposure.
Recommendation from Workgroup 1

Based on the lung cancer LDCT screening studies in heavy smokers, the exposure-response data on asbestos exposure and lung cancer, and the more than additive effect of asbestos exposure and smoking, we recommend the following groups for LDCT screening:

1) Workers with any asbestos exposure and a smoking history equal to the minimum entry criteria of the NLST study

2) Workers with asbestos exposure with or without a smoking history which alone or together would yield an estimated lung cancer risk equal to the minimum entry criteria of the NLST study
Screening recommendations (continued)

• First, existing databases should be assessed for the potential to verify the generalizability of the Lung Cancer Screening RCT results to asbestos exposed adults.

• Second, since our recommendations are based on inferential evidence and modeling, the introduction of lung screening in asbestos exposed workers must be viewed as a research program in order to verify these assumptions. We strongly recommend an international multicenter research project on the effect of LDCT screening among asbestos exposed workers to acquire the necessary evidence.

• Evidence may also be gained through modeling of existing data, especially from the NLST study.