



# **Screening for asbestos-related lung cancer**

**Nea Malila, Tony Miller, Riitta Sauni, Robert Smith,  
Kurt Straif, Tapio Vehmas**

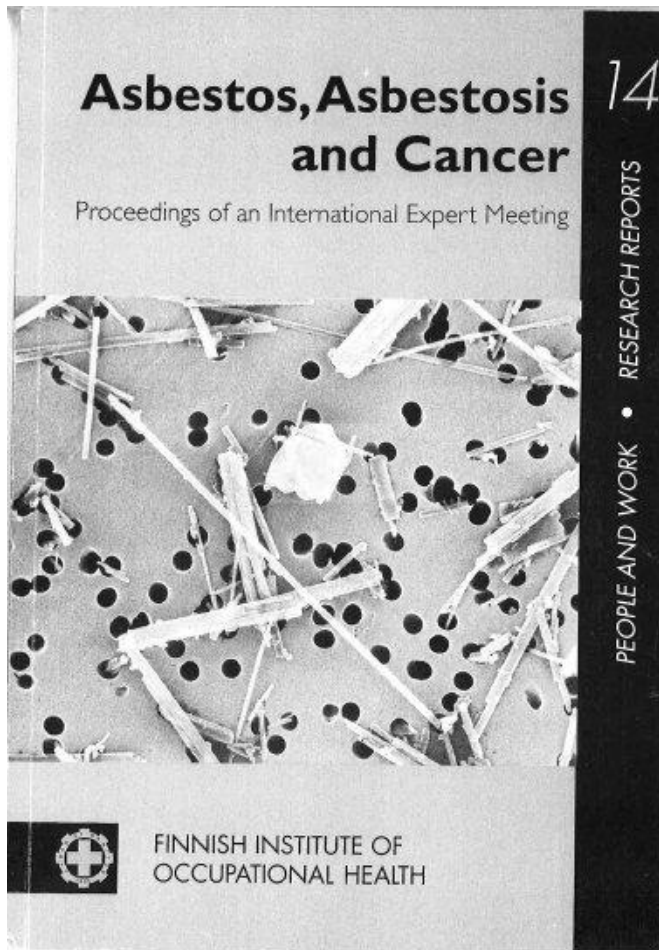
**International Agency for Research on Cancer  
Lyon, France**

**International Conference on Monitoring and  
Surveillance of Asbestos-Related Diseases**

**Helsinki Criteria Update**

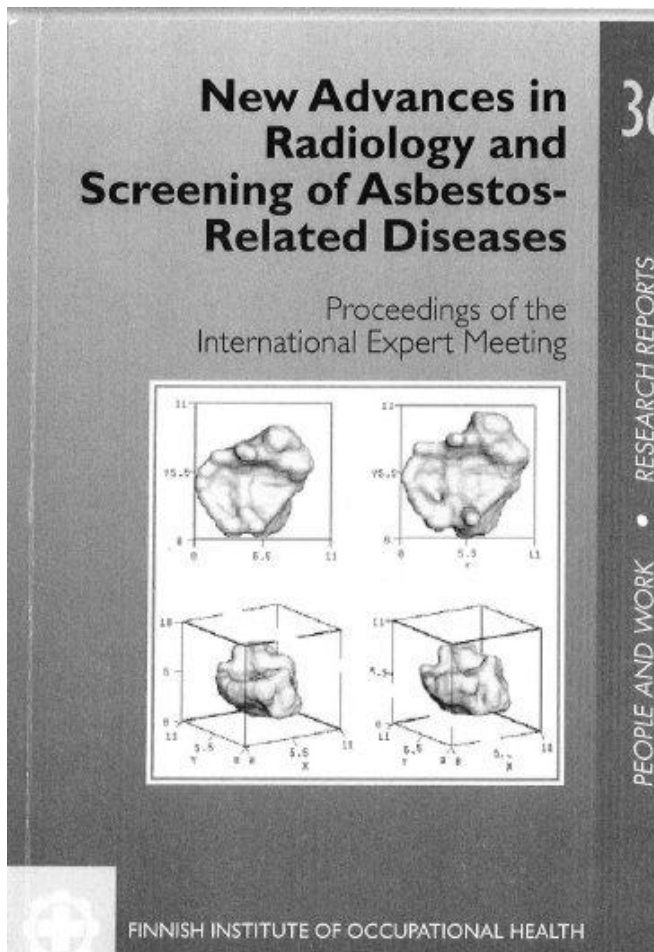
**11-13 February 2014, Hanasaari Cultural Center, Espoo, Finland**

## **Asbestos, asbestosis, and cancer: the Helsinki criteria for diagnosis and attribution**



- **There was no direct recommendation for lung cancer screening**
- **“Further studies on the effectiveness of screening programs are needed.”**

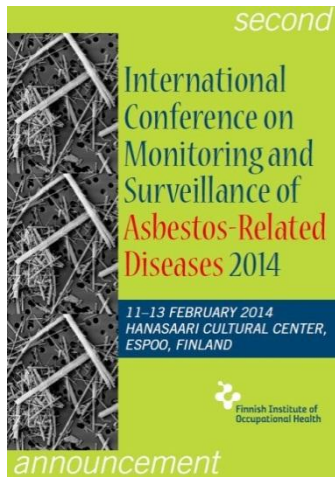
## International expert meeting on new advances in the radiology and screening of asbestos-related diseases



- 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.**

# International Conference on Monitoring and Surveillance of Asbestos-Related Diseases 2014

11-13 February 2014, Hanasaari Cultural Center, Espoo, Finland



## 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\*

THE NEW ENGLAND JOURNAL OF MEDICINE

ORIGINAL ARTICLE

## Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening

The National Lung Screening Trial Research Team\*

ABSTRACT

**BACKGROUND**

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 helical computed tomography (CT) altered the landscape of lung-cancer screening, with studies indicating that low-dose CT detects many tumors at early stages. The National Lung Screening Trial (NLST) was conducted to determine whether screening with low-dose CT could reduce mortality from lung cancer.

**METHODS**

From August 2002 through April 2004, we enrolled 53,454 persons at high risk for lung cancer at 33 U.S. medical centers. Participants were randomly assigned to undergo three annual screenings with either low-dose CT (26,722 participants) or single-view posterior-anterior chest radiography (26,732). Data were collected on cases of lung cancer and deaths from lung cancer that occurred through December 31, 2009.

**RESULTS**

The rate of adherence to screening was more than 90%. The rate of positive screening tests was 24.7% with low-dose CT and 6.9% with radiography over all three rounds. A total of 96.4% of the positive screening results in the low-dose CT group and 94.9% in the radiography group were false positive results. The incidence of lung cancer was 645 cases per 100,000 person-years (1060 cancers) in the low-dose CT group, as compared with 572 cases per 100,000 person-years (941 cancers) in the radiography group (rate ratio, 1.13; 95% confidence interval [CI], 1.03 to 1.23). There were 247 deaths from lung cancer per 100,000 person-years in the low-dose CT group and 309 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 20.0% (95% CI, 6.8 to 26.7;  $P=0.004$ ). 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, 1.2 to 13.6;  $P=0.02$ ).

**CONCLUSIONS**

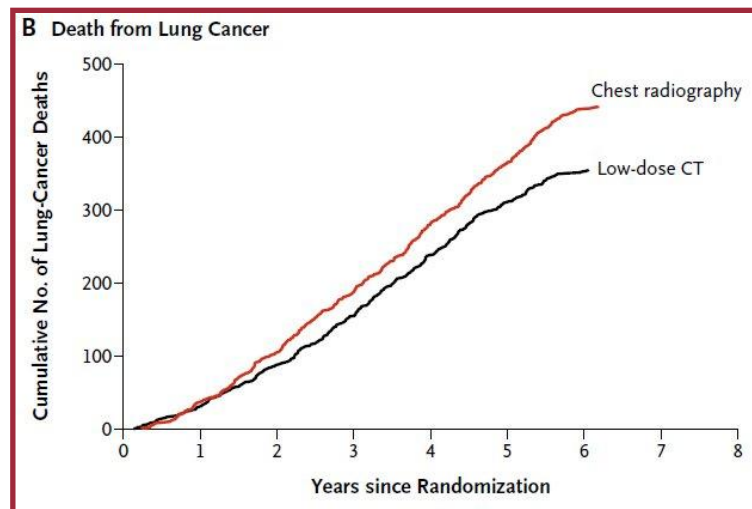
Screening with the use of low-dose CT reduces mortality from lung cancer. (Funded by the National Cancer Institute; National Lung Screening Trial ClinicalTrials.gov number, NCT00047385.)

The members of the writing team (who are listed in the Appendix) assume responsibility for the integrity of the article. Address reprint requests to Dr. Christine D. Berg at the Early Detection Research Group, Division of Cancer Prevention, National Cancer Institute, 1310 Executive Blvd., Suite 3112, Bethesda, MD 20892-7346, or at [bergd@mail.nih.gov](mailto:bergd@mail.nih.gov).

\*A complete list of members of the National Lung Screening Trial research team is provided in the Supplementary Appendix, available at [nejm.org](http://nejm.org).

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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.

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

# 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.



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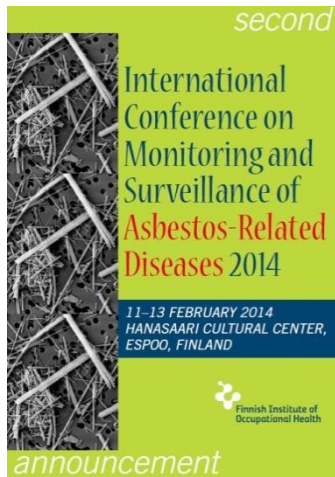
**Chest computed tomography screening for lung cancer in asbestos occupational exposure: a systematic review and meta-analysis**

Marie Ollier, Jr, Hons; Alain Chamoux, MD, PhD; Geraldine Naughton, PhD; Bruno Pereira, PhD; Frédéric Dutheil, MD, PhD



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## 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.