Early Lung Cancer Detection in a High-Risk Population

Evaluation of Early Lung Cancer Detection in a Population at High Risk due to Occupation

Knut Ringen, John Dement, Sammy Almashat, Marianne Cloeren, William Grier, Stella Hines, Laura Welch, Kim Cranford, Janet Shorter, Patricia Quinn, Anna Chen. American Journal of Industrial Medicine. 2025.

Overview

The Building Trades National Medical Screening Program (BTMed) offers free medical exams to former construction workers at U.S. Department of Energy nuclear weapons facilities. BTMed includes an Early Lung Cancer Detection (ELCD) Program, which provides annual low-dose CT scans to participants who meet certain eligibility requirements, as well as follow-up scans sooner if necessary. By accounting for risk factors, such as occupational exposures, ELCD eligibility requirements enable greater participation than the guidelines from the U.S. Preventive Services Task Force (USPSTF), which currently include only age and smoking. This study comprised 1,941 ELCD participants, the majority of whom were exposed during their work to hazards such as asbestos, radiation, silica, and other contaminants. The researchers compared medical results of two groups in BTMed: participants in the ELCD Program and those who qualified but did not participate. The study was unique in that it assessed the impact of using expanded eligibility guidelines that consider occupational history.

Key Findings

- Lung cancer was detected in 57 (2.94%) ELCD participants, with 40 of the cases being in Stage I or II. A 49% reduction in lung cancer mortality was observed among ELCD participants compared to those who did not participate.
- Lung cancer screening for BTMed's high-risk population—with eligibility adjusted for occupational history and no time limit since last having smoked—reduced lung cancer mortality. This eligibility criteria was better at identifying high-risk individuals than the USPSTF 2021 criteria.
- USPSTF lung cancer screening eligibility criteria should reduce the required smoking pack-years (1 pack-year = 1 pack per day for a year) when adding occupational risk factors and should eliminate the exclusion of those who quit smoking more than 15 years ago.
- About 25% of those eligible participated in the ELCD Program, greatly exceeding the national level of lung cancer screening participation, which averages 6%. Participants returned 92% of the time for their annual scans, also greatly exceeding the national rate of 55%. These figures suggest that population-specific screening efforts can encourage participation.

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