

# Improved diagnostic performance of low-dose computed tomography screening

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Investigators of the COSMOS (Continuous Observation of SMOKing Subjects) study show good compliance and patient survival outcomes using a 5-year low-dose computed tomography (LDCT) screening protocol in individuals at high-risk of developing lung cancer. This protocol had fewer patients requiring further diagnostic follow-up compared to other studies, including the National Lung Cancer Screening Trial (NLST), with a minimal number of incorrect diagnoses.

The 5-year survival rate for early diagnosed lung cancer is 50% but after the cancer has spread to distant regions it is only 4%. Recently, the NLST showed a 20% lung cancer mortality reduction with LDCT compared to chest x-ray, which verified that early detection can decrease lung cancer deaths. However, few studies have rigorously assessed the diagnostic performance, invasiveness and side effects of LDCT screening protocols with enduring follow-up.

The COSMOS study screened 5203 asymptomatic high-risk subjects (age  $\geq 50$  and  $\geq 20$  pack years smoking history) who, based on the study criteria, either went on to other diagnostic procedures (CT, PET, or surgery) to verify lung cancer, or were rescreened every year for the next 4 years. All subjects were clinically followed for a median of 5.2 years.

The results of this study, reported in the July issue of the *Journal of Thoracic Oncology (JTO)*, the official journal of the International Association for the Study of Lung Cancer, show that overall, 79% of the participants remained on the study for 5 years and only 6.4% required a

procedure beyond the annual LDCT. Primary lung cancer was diagnosed in 175 patients and 78% of these were diagnosed with localized disease. Due to the size and long follow-up, there were 23,116 person-years of observation. Therefore, the overall lung cancer detection rate was 0.76 per 100 person-years. Out of the 204 invasive diagnostic procedures, 29 were benign for [lung cancer](#), 34 had minor complications, 12 major complications and 1 post-operative fatality was reported. There were 14 cases where the lesions were not diagnosed as cancer, but were later determined to be cancer on subsequent yearly screening. A high proportion of the cancers (87%) were treated with intent to cure and the overall 5-years survival was 78%.

"The results of the COSMOS workup protocol for indeterminate nodules detected with LDCT screening are encouraging, particularly the low recall and delayed diagnosis rates as well as the good long-term survival," says Dr. Giulia Veronesi, lead author of the study and member of IASLC. "However, the workup can still be improved, possibly by tailoring the [screening](#) interval to the risk of the individual being screened using a risk evaluation algorithm that will hopefully also include in the near future molecular markers like a microRNA expression signature in serum."

Provided by International Association for the Study of Lung Cancer

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