

Lung cancer is the leading cause of cancer related mortality among both men and women, accounting for approximately 18% of all cancer deaths globally. According to the World Health Organization there were in 2018 more than 2.09 million cases of lung cancer and 1.76 million lung cancer deaths worldwide. Lung cancer causes more deaths worldwide than all breast, colorectal, and cervical cancer deaths combined, for which there are population-based screening programmes. Only 15% of lung cancer patients are still alive after five years, as approximately 70% of patients are diagnosed with advanced disease. Although smoking prevalence is decreasing, 28% of European adults still currently smoke and smoking initiation remains substantial in youths. Thereby, the health risks of former smokers remain elevated for decades. Lung cancer and other tobacco-related (co-)diseases are expected to remain important health problems worldwide for decades. Generally, when identified early, cancer is more likely to respond to effective treatment and can result in a greater probability of surviving, less morbidity, and less expensive treatment. Significant improvements can be made in the lives of cancer patients by detecting cancer early and avoiding delays in care.

Presently, after smoking cessation, the most effective health care intervention for lung cancer is early detection and screening with low-dose computed tomography (LDCT). Although the National Lung Screening Trial (NLST; U.S.) reported in 2011 an overall 20% and an 8% male lung cancer-related mortality reduction, a very high false positive rate of 23% with a low positive predictive value of 3.8% raised many doubts of the (cost) effectiveness of early detection and screening of lung cancer. The many European trials could not provide more evidence because there were underpowered or suffered from methodological errors. Recently, in January 2020, the results of the NELSON study at 10 years follow up were published and finally could provide the evidence needed to go forward with CT early detection of lung cancer. The NELSON reported a 24% mortality reduction in males and a 33% mortality reduction in females (a significant 59% at 8 years follow up) with a low 1.2% false positive rate and a positive predictive value of 43.5%. The overall referral rate for suspicious nodules was only 2.1%. Key difference between the NLST and the NELSON is the methodology. The NELSON study applied nodule volume as primary stratification tool and used nodule growth rate as imaging biomarker for indeterminate nodules. The favorable outcomes of the NELSON study launch the implementation of early detection and screening of lung cancer worldwide. The lung cancer stage shift is expected to lead to stable stage I disease percentages of over 70% in all detected lung cancer patients. This will have substantial impact on therapy options and treatment outcomes. In addition, the differences in screening effects between men (24% mortality reduction) and women (33%-59% mortality reduction), emphasize the importance of gender-specific tailoring of health care interventions and open up the opportunity to design growth rate dependent screen interval regimens related to gender and expected tumor tissue histology.

An important difference with conventional approaches is that the lung cancer patient/participant has to be identified before presentation of symptoms or sofar before any biomarker by liquid biopsy can support the diagnosis. Therefore, key to the success of this early detection and treatment of lung cancer is the multidisciplinary approach along the whole chain of workup from patients recruitment, diagnosis (CT imaging, tissue biopsy, pathology, multidisciplinary therapy (surgical, chemo, radiotherapy) and clinical care. This early CT detection of lung cancer should be followed by early treatment without delay by which a high curation rate will be within reach in early stages without metastatic disease, but also by more effective therapy options in earlier disease stages. The current book volume “MultiDisciplinary Approaches to Lung Cancer” aims to cover the whole chain of approaches from recruitment, selection and diagnosis to multidisciplinary treatment and care. We hope and expect that the readers will be supported by the further steps that have to be taken to achieve the maximum benefit of lung cancer disease detection before tumor metastasis in the majority of patients.

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