

## Utilizing Lung Cancer Screening with Low Dose Computed Tomography to Decrease Mortality Rate of Lung Cancer

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**Received:** January 27, 2022; **Published:** February 18, 2022

Lung cancer screening with low dose computed tomography is an effective secondary prevention method for lung cancer [1]. Screening for individuals at high risk for lung cancer has the potential to improve lung cancer survival rates by finding the disease at an earlier stage when it is more likely to be curable. It was reported that about eight million Americans qualify as high risk for lung cancer and are recommended to receive annual screening with low dose computed tomography scans [2]. If half of these high-risk individuals were screened, over 12,000 lung cancer deaths could be prevented [2]. Lung cancer screening with low dose computed tomography has been proved to reduce the mortality rate of lung cancer by 20%, compared to the standard chest X-ray, among current or former smokers who had smoked at least 30 pack-year (smoked one pack of cigarettes per day for 30 years) or had quit smoking within the past 15 years [1,3]. Since 2013, the United States Preventive Services Task Force and other organizations have issued guidelines for the early detection of lung cancer with yearly low dose computed tomography among high-risk population [4]. It was covered both by the private and public health insurances for the high-risk population (adults aged 55 to 74 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years) [5].

### History of lung cancer screening guidelines

In 1970, American Cancer Society issued a guideline to screen lung cancer. In the guideline, Chest X-ray with or without sputum cytology was recommended as an effective way to find lung cancer early [3]. However, in 1980, American Cancer Society retracted this guideline, because limited evidence was found to support the Chest X-ray's efficiency to decrease lung cancer mortality rate [3]. They decided that the remain high mortality rate of lung cancer as well as significant false positive and false negative results for lung cancer after Chest X-ray screening were not able to benefit the high-risk population [3]. In 2002, the National Lung Screening Trial began to conduct an eight-year randomized clinical trial to test the efficiency of Chest X-Ray and low dose computed tomography on the outcome of decreasing the mortality rate of lung cancer [6]. This clinical trial was conducted with 53,454 participants who were at high risk for lung cancer (people who were aged 55 - 74 years old, had smoked at least one package of cigarettes every day for 30 years, and were current smokers or quit smoking in the past 15 years) [6]. The participants were required to receive three annual lung cancer screening with Chest X-Ray or low dose computed tomography. Results showed that the death rate of lung cancer among the participants who screened lung cancer by low dose computed tomography was 20% less than that among the participants who screened lung cancer by Chest X-Ray [6].

Based on the National Lung Screening Trial results, in 2013, the United States Preventive Service Task Force began to recommend high risk population to receive annual low dose computed tomography to screen lung cancer [7]. In January 2015, the Affordable Care Act mandated private health insurance companies to cover lung cancer screening with low dose computed tomography for eligible high-risk U.S. population [5]. In February 2015, the Centers for Medicare and Medicaid Services began to cover low dose computed tomography lung cancer screening with the physicians' prescription and shared decision-making documents [8]. After that, several other organizations,

such as American Cancer Society, American College of Chest Physicians, American Society of Clinical Oncology, American Lung Association, and National Comprehensive Cancer Network started to support and recommend lung cancer screening with low dose computed tomography [4].

### Lung cancer screening uptake rates

Although the supportive landscape has changed, uptake rates of lung cancer screening with low dose computed tomography remain low after the United States Preventive Service Task Force guideline was published [9,10]. The percentage of eligible population who had received lung cancer screening with low dose computed tomography just increased from 3.3% in 2010 to 3.9% in 2015 among U.S. population [11]. Reports about the uptake rates of lung cancer screening among minority populations were even lacking.

With high mortality rates of lung cancer in both genders in the United States (American Cancer Society, 2018), it would be beneficial to utilize lung cancer screening with low dose computed tomography to detect lung cancer at an earlier time. It is health care providers' responsibility to initiate conversations about smoking cessation and recommend lung cancer screening with low dose computed tomography with/to their high-risk smoker clients. Proactive health education about lung cancer screening and shared decision making about annual lung cancer screening will potentially help to decrease the mortality rate of lung cancer and public health burden.

### Bibliography

1. Tota JE, *et al.* "Lung cancer screening: Review and performance comparison under different risk scenarios". *Lung* 192 (2014): 55-63.
2. Cheung LC, *et al.* "Preventing Lung Cancer Mortality by Computed Tomography Screening: The Effect of Risk-Based Versus U.S. Preventive Services Task Force Eligibility Criteria, 2005–2015". *Annals of Internal Medicine* 168.3 (2018): 229-232.
3. Wender R, *et al.* "American Cancer Society lung cancer screening guidelines". *CA: A Cancer Journal for Clinicians* 63 (2013): 106-117.
4. Latimer KM and Mott FF. "Lung cancer: Diagnosis, treatment principles, and screening". *American Family Physician* 91 (2015): 250-256.
5. Bindman A. "JAMA forum: Lung cancer screening and evidence-based policy". *The Journal of the American Medical Association* 313 (2015): 17-18.
6. Aberle DR, *et al.* "Results of the two incidence screenings in the National Lung Screening Trial". *New England Journal of Medicine* 369 (2013): 920-931.
7. United States Preventative Services Task Force. Final updated summary lung cancer: Screening. Rockville, MD: U.S. Preventative Services Task Force (2015).
8. Centers for Medicare and Medicaid Services. National Coverage Determination (NCD) for screening for lung cancer with low dose computed tomography (low dose computed tomography screening) (2015).
9. Hoffman RM, *et al.* "Attitudes and beliefs of primary care providers in New Mexico about lung cancer screening using low dose computed tomography". *Preventing Chronic Disease* 12 (2015): E108.
10. Lewis JA, *et al.* "Low-dose CT lung cancer screening practices and attitudes among primary care providers at an academic medical center". *Cancer Epidemiology, Biomarkers and Prevention* 24 (2015): 664-670.
11. Jemal A and Fedewa SA. "Lung cancer screening with low dose computed tomography in the United States-2010 to 2015". *JAMA Oncology* 3 (2017): 1278-1281.

**Volume 4 Issue 3 March 2022**

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