

# The Negative Consequences of False Negative Lung Cancer Screenings

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**Introduction:** Lung cancer is the leading cause of cancer death in the United States of America (1). The US Preventive Services Task Force recommends an annual low-dose computed tomography scan (LDCT) for 50- to 80-year-old adults with a 20 pack-year smoking history or more who are current smokers or have quit smoking within the past 15 years (2). Although it has been shown to be effective in reducing mortality rates (3), LDCT screening tests have false-negative rates of up to 15% (4). We present a patient with a negative lung cancer screening who was diagnosed with advanced lung cancer seven months after negative screening results.

**Case Presentation:** An LDCT scan for a 61-year-old female, with a past medical history significant for Chronic Obstructive Pulmonary Disease (COPD) and a 40 pack-year smoking history, revealed a benign screening result. LDCT in October 2021 revealed calcified granulomas and a 3mm lingular lung nodule consistent with Lung RADS category 2. Seven months later the patient was admitted to the hospital with shortness of breath, and a productive cough. Chest X-ray revealed patchy infiltration in the left upper lobe consistent with lobar pneumonia. The patient received a full course of antibiotics for community acquired pneumonia. Ten days later, following worsening symptoms, A CT scan of the chest demonstrated a left upper lobe mass suspicious for neoplasm. Subsequent Lung biopsy revealed small cell carcinoma. Bone scan also demonstrated possible osseous metastasis. Chemotherapy started for the patient with carboplatin/etoposide, A positron emission tomography (PET) scan was obtained due to severe pain in her spine, mid- and lower-back, and a compression fracture in L3 which demonstrated significant disease progression in the skeleton with foci of increased activity in the thoracic, lumbar, and sacral portions of the spine worrisome for metastasis. Palliative radiation therapy started to help with pain.

**Conclusion:** Lung cancer screening requires a shared decision-making visit. Required elements of this visit that must be documented include false positive rates, overdiagnosis and possible further evaluations<sup>5</sup>. However, there is no requirement to discuss false negative results or the possibility of interval diagnosis of lung cancer between annual screenings in a shared decision-making visit (5).

Those with negative results may be less likely to present in the event of developing symptoms or may interpret their symptoms as insignificant and believe they are unlikely to develop lung cancer. It may also cause false reassurance for health care workers, causing a delay in appropriate testing (4). Furthermore, a negative test may result in a reluctance to change detrimental health-related behaviors, such as smoking (4). Providers should educate their patients that LDCT can have false negative results and this discussion about possible false negative results and the possibility of a tumor developed de novo after the negative screening test should be added to the requirements of a shared decision-making visit.

## References

1. American Cancer Society. *Facts & Figures 2023*. American Cancer Society. Atlanta, Ga. 2023.
2. US Preventive Services Task Force; Krist, A.H, Davidson, K.W., Mangione, C.M., Barry, M.J., Cabana, M., Caughey Donahue, K.E., Doubeni, C.A., Kubik, M., Landefeld, C.S., Li, L., Ogedegbe, G., Owens, D.K., Pbert, L., Silverstein, M., Steve Wong, J.B. *Screening for Lung Cancer: US Preventive Services Task Force Recommendation Statement*. JAMA, 2021 Mar 9. **325**(10): pp. 962-970.
3. Cheung, L.C., Katki, H.A., Chaturvedi, A.K., Jemal, A., Berg, C.D. *Preventing lung cancer mortality by computed to The effect of risk-based versus U.S. Preventive Services Task Force Eligibility Criteria, 2005–2015*. Annals of Internal Medicine, 2018. **168**(3): p. 229. doi:10.7326/m17-2067
4. Bartlett, E.C., Silva, M., Callister, M.E., Devaraj, A. False-negative results in lung cancer screening—evidence a Journal of Thoracic Oncology, 2021. **16**(6):912-921
5. [https://www.acr.org/-/media/ACR/NOINDEX/Advocacy/CT-LCS-shared-decision-making\\_fillable.pdf](https://www.acr.org/-/media/ACR/NOINDEX/Advocacy/CT-LCS-shared-decision-making_fillable.pdf)