

Where do Incidental Lung Nodule Programs Fit in the Age of Lung Cancer Screening?

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The management of malignant lung nodules remains a challenging task for pulmonary physicians. While clear guidelines have been established for diagnosing and surgically resecting malignant solitary lung nodules, identifying malignant nodules at early stages remains daunting. In fact, 83% of new lung cancers are diagnosed as late stage (stages 3 or 4). Despite compelling data highlighting the importance of lung cancer screening, attempts at shifting the treatment of late stage lung cancers to early stage lung cancers, stage 1 and 2, have been disappointing.

The use of low-dose computer tomography (LDCT) scans for annual lung cancer screening in a distinct high-risk population confers a substantial survival benefit by reducing cancer related deaths [1]. The United States Preventative Services Task Force (USPSTF) based this recommendation from the 2011 National Lung Screening Trial (NLST) which was a large, randomized-controlled study performed by Aberle, *et al.* This study revealed a relative reduction in mortality from lung cancer with low-dose CT screening of 20.0% in high-risk populations. Such a finding was anticipated to catapult lung cancer screening into the ranks of breast cancer screening to help achieve a stage shift for the treatment of lung cancer.

Despite the compelling evidence encouraging the development of nationwide lung cancer screening programs, a number of hurdles have been encountered including, but not limited to, access to lung cancer navigators, access to effective nodule tracking software, and the minimal profit margin associated with these programs. Furthermore, the Aberle, *et al.* study revealed the rate of positive screening tests was 24.2% in the low-dose CT group with a 96.4% false positive rate across all three rounds of screening. This high false positive rate has been identified in additional studies, highlighting the importance of preparing patients that positive screening results do not necessarily indicate positive findings of cancer [2]. Unfortunately, the effort and resources dedicated to screening for nodules combined with the incidence of false positives may put a significant financial strain on lung screening programs.

While significant focus has been placed on creating lung cancer screening programs, the importance of incidental nodule tracking programs has been overlooked. Incidental nodules are defined as pulmonary nodules that are detected on imaging studies performed for an unrelated reason. Hundreds of thousands of incidental pulmonary nodules are discovered each year. These nodules are commonly identified on CT scans ordered in emergency departments (ED) to evaluate for a pulmonary embolus [3]. Unfortunately, these nodules are frequently not followed-up appropriately in the outpatient setting [4]. This appears to result from failure to discuss the CT scan report with the patient or by under emphasizing the risk associated with such findings. As a result, patients with potential early stage lung cancers are not adequately triaged for appropriate workup. Additionally, similar to lung cancer screening programs, the false positive rate of incidental nodules is high. Recently, specific guidelines have been developed for following incidental nodules [5].

Despite having many challenges, development of programs to adequately follow-up on incidental nodules has the potential to diagnose early stage lung cancers in high-risk patients. The potential with the incidental nodule population may be even greater than what is currently seen with lung cancer screening. Unlike lung cancer screening programs, incidental nodule programs do not have strict guidelines governing operation, such as pre-screening counseling or smoking cessation programs. Instead, implementation of an incidental nodule program can succeed through effective communication between ED physicians, radiologists, and pulmonologists or lung navigators. When an incidental nodule is detected following a CT scan obtained in the ED, triaging patients to a lung navigator or appropriate outpatient practitioners will ensure that adequate follow-up occurs. Furthermore, dedicated software already exists to efficiently and effectively direct these patients to appropriate physicians. According to current guidelines, these high-risk patients can be identified, biopsied, and potentially cured without adding the significant resources seen with lung cancer screening programs. Additionally, the high rate of negative CT scans seen in lung cancer screening is eliminated.

While the advent of lung cancer screening harbors great potential for achieving a stage shift in lung cancer treatment, the benefits of incidental nodule programs should not be underappreciated. Few resources are necessary to implement incidental nodule programs and these programs can be molded to suit the specific needs of individual institution. While hospitals gear up to develop lung cancer screening programs across the country, appropriate attention should be given of incidental nodule programs, as they may be the first step to achieving a true stage shift in lung cancer therapy.

Conflicts of Interest

No conflicts of interest to declare.

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