

When is a Solid Incidental Pulmonary Nodule Worth Following?



Background

Despite significant therapeutic advances, early detection of lung cancer remains the best opportunity to improve outcomes and survival rates for the leading cause of cancer-related mortality worldwide. Although many incidental nodule programs choose not to follow smaller nodules due to resource constraints and low prevalence of malignancy^[1], it is important to remember that all large, malignant nodules were once smaller nodules that were never imaged or followed. Additionally, the speed of nodule growth is a reliable predictor of malignancy risk^[2,3]. In this retrospective analysis, we evaluated the prevalence and magnitude of growth over one year among smaller nodules that are less likely to be actively monitored.

Methods

A retrospective analysis of incidental lung nodules from 170 facilities was conducted using the Eon dashboard. Imaging data were extracted from radiology reports using Eon's Computational Linguistics model. The dataset included all initial and follow-up lung CT exams between 9/1/2021 and 8/31/2024.

Low- and moderate-risk patients were defined as patients with an initial CT scan showing a lung nodule measuring <6mm (low risk) or 6-8mm (moderate risk) performed between 9/1/2021 and 8/31/2023. Follow-up exams were identified as CT scans performed between 330 and 390 days after the initial exam with a resulting lung nodule measurement of any size. Patients were excluded from analysis if they lacked subsequent CT scans in this timeframe or if the follow-up scan had no measurement. The last chronological exam was chosen for patients with multiple CT scans in the follow-up window.

Results

The final dataset included 6,380 qualifying patients. Over one quarter (26.2%) of patients with initially low- or moderate-risk nodules had moved up to a higher-risk category based on the results of their follow-up scans one year later. Over 7% of patients had moved from low-risk to high-risk in one year.



26.2%
of patients moved up
to a higher-risk category



16.7%
of patients became
high-risk

Conclusion

The data suggests that organizations not actively surveilling lower-risk patients may miss their opportunity to intervene at the earliest stages of malignancy given the significant nodule growth observed in this cohort in just a year. These findings increase the importance of conversations around nodule program capacity and efficiency. At a minimum, effective solutions should include intelligent automation of routine tasks, multimodal patient and provider communication, and EHR integration to reduce the time needed to deliver evidence-based care to patients and enable programs to follow lower-risk patients without sacrificing quality of care.

Overall N=6,380		
1-YEAR CHANGE IN FLEISCHNER RISK CATEGORY		
Low to high	463	7.3%
Low to moderate	612	9.6%
Moderate to high	597	9.4%
Shrank (moderate to low)	588	9.2%
Stayed low	2,792	43.8%
Stayed moderate	1,328	20.8%
1-YEAR CHANGE IN NODULE SIZE (IN MM)		
Mean (SD)	2.05	7.90
Median (Min, Max)	0	-6.00, 155

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