

Evidence Discussion (CH 16.3)

Interval Imaging Outcomes

If a chest X-ray (CR) or chest CT has demonstrated that a pulmonary nodule has benign characteristics, further imaging is not necessary. Benign characteristics include intranodular fat or a diffuse, central, laminated or popcorn pattern of calcification.(1)

If an indeterminate nodule is seen on a CR or CT, prior studies should be reviewed to determine possible growth or stability, including comparison with the earliest available study and more recent ones.(1,2,3). If stability of a nodule seen on CR cannot be determined, CT chest is appropriate.(1,3) If a solid nodule has been stable for at least 2 years, no additional evaluation is necessary.(1) Two years of radiographic stability is considered strong presumptive evidence of a benign nodule. For solid nodules seen on CT, further follow up is not needed if nodules < 6 mm have been stable for one year or if nodules greater than or equal to 6 mm have been stable for two years(2). Malignant nodules show a wide range of growth rates with some demonstrating regression at times. Solid nodules greater than or equal to 6 mm that decrease in size but do not completely resolve should be followed to resolution or lack of growth over 2 years.(1,4)

There is controversy regarding how long to follow part solid or ground glass nodules. Follow up over several years may be appropriate.(1) The Fleischner guidelines state that subsolid nodules< 6 mm may be followed for up to 4 years but that the guidelines are not intended to preclude either shorter or longer term follow up in individual patients when deemed clinically appropriate(2). Subsolid nodules greater than or equal to 6 mm may be followed for 5 years. The 5 year period is “somewhat arbitrary but considered reasonable if the nodule is unequivocally stable during that time period.”(2)

PET/CT should be considered for solid nodules greater than or equal to 8 mm.(1,2) If a solid nodule shows clear growth on serial CT's, a non-surgical biopsy or surgical resection is recommended unless there are specific contraindications.(1) Non-solid nodules which grow or develop solid components are often malignant and further evaluation and/or resection should be considered. (1,4)

If a CT demonstrates multiple solid nodules< 6 mm *and* there is clinical evidence of infection or the patient is immunocompromised, infection should be considered and a short term follow up CT may be appropriate.(2) Certain findings on a lung cancer screening CT which suggest an infectious or inflammatory process (e.g. >6 new nodules or solid nodules which are greater than or equal to 8 mm appearing in a short interval) are reported as Lung-RADS 0 and may be followed up with a LDCT in 1-3 months.(5) Some findings indicative of an infectious/inflammatory process may not warrant short-term follow-up (e.g. tree-in-bud nodules or new <3 cm ground glass nodules).

1. Gould MK, Donington J, Lynch WR, et al. Evaluation of individuals with pulmonary nodules: when is it lung cancer? Diagnosis and management of lung cancer, 3rd ed: ACCP evidence-based clinical practice guidelines. Chest. 2013 May;143(5 Suppl):e93S-e120S.
2. MacMahon G, Naidich DP, Goo JM, et al. Guidelines for Management of Incidental Pulmonary Nodules Detected on CT Images: From the Fleischner Society 2017. Radiology. 2017 Jul;284(1):228-243.

3. Martin MD, Henry TS, Berry MF, et al. ACR Appropriateness Criteria Incidentally Detected Indeterminate Pulmonary Nodule. Expert Panel on Thoracic Imaging. J Am Coll Radiol. 2023 Nov;20(11S):S455-S470.
4. Callister ME, Baldwin DR, Akram AR, et al. British Thoracic Society guidelines for the investigation and management of pulmonary nodules. Thorax. 2015 Aug;70 Suppl 2:ii1-ii54.
5. Christensen J, Prosper AE, Wu CC, et al. ACR Lung-RADS v2022: Assessment Categories and Management Recommendations. J Am Coll Radiol. 2024 Mar;21(3): 473-488.