



Incidental Pulmonary Nodule

Fleischner 2017 · Size, density and risk set the interval — and most small nodules need nothing

< 6 mm

usually no follow-up

CHECK THE GUIDELINE APPLIES *using it on the wrong patient is the commonest error*

IT DOES NOT APPLY TO

Anyone under 35, in whom infection is far likelier and radiation matters more · **lung cancer screening programs**, which use **Lung-RADS** instead · **immunocompromised patients** · and **patients with a known primary cancer**, where a nodule may be a metastasis and needs oncological rather than Fleischner management.

MEASURE IT PROPERLY

Average the long and short axis on the same transverse image, to the nearest millimetre, or use **volumetry** (100 mm³ and 250 mm³ correspond to the 6 mm and 8 mm thresholds). **Use the same method on every follow-up** — switching between diameter and volume manufactures apparent growth.

FIND THE OLD IMAGING FIRST

The highest-value action before any follow-up plan. A **solid nodule unchanged for 2 years is effectively benign** and needs nothing further. Chase prior CTs, and check radiographs and imaging done for other reasons — this alone spares many patients years of surveillance.

SOLID NODULES *Fleischner 2017 follow-up intervals*

Size	Low risk	High risk
Single, < 6 mm < 100 mm ³	No routine follow-up.	Optional CT at 12 months. Consider it where the morphology is suspicious, the location is upper lobe, or both.
Single, 6–8 mm 100–250 mm ³	CT at 6–12 months, then consider CT at 18–24 months.	CT at 6–12 months, then CT at 18–24 months.
Single, > 8 mm > 250 mm ³	Consider CT at 3 months, PET/CT, or tissue sampling — the same for both risk groups. This is the size at which active characterization replaces watchful surveillance.	
Multiple, < 6 mm	No routine follow-up.	Optional CT at 12 months.
Multiple, ≥ 6 mm	CT at 3–6 months, then consider CT at 18–24 months.	CT at 3–6 months, then CT at 18–24 months.
With multiple nodules, use the most suspicious nodule to drive management, and adjust the interval for size and risk.		

SUBSOLID NODULES *slower growing, so followed longer — not less seriously*

Type and size	Recommendation
Ground-glass, single, < 6 mm	No routine follow-up. In selected suspicious nodules, consider CT at 2 and 4 years.
Ground-glass, single, ≥ 6 mm	CT at 6–12 months to confirm persistence, then CT every 2 years until 5 years. The long tail matters: these can be indolent adenocarcinoma in situ, so early stability is not discharge.
Part-solid, single, < 6 mm	No routine follow-up. In practice a nodule cannot reliably be called part-solid below 6 mm.
Part-solid, single, ≥ 6 mm	CT at 3–6 months to confirm persistence. If unchanged and the solid component remains under 6 mm, annual CT for 5 years. A persistent solid component of 6 mm or more is highly suspicious and warrants active management.
Multiple subsolid	CT at 3–6 months. If under 6 mm and stable, consider CT at 2 and 4 years. If 6 mm or larger, base subsequent management on the most suspicious nodule.
Why the first scan is early	Many subsolid nodules are transient inflammatory or infective change and simply disappear. The early repeat exists to confirm persistence before committing anyone to years of surveillance.
What counts as growth	An increase of 2 mm or more in mean diameter is generally taken as real rather than measurement noise, and volumetry detects change earlier and more reproducibly. Volume doubling times under about 400 days suggest malignancy; very short doubling times point instead to infection or inflammation, and very long ones to indolent disease. Any unequivocal growth, or a new or enlarging solid component in a subsolid nodule, ends surveillance and triggers active management.
Weigh the downsides of surveillance	Each follow-up carries radiation, cost, and considerable patient anxiety, and a proportion of pathways end in a biopsy or resection of benign disease. Say explicitly that the nodule is very probably benign and that the scans exist to confirm stability — patients routinely hear "we found something on your lung" as a cancer diagnosis. Discuss frailty and comorbidity too: surveillance is only worth starting in someone who would accept and tolerate treatment if it were positive.

JUDGING RISK AND ESCALATING *morphology and context, not size alone*

RAISES SUSPICION

Older age, current or heavy smoking, other inhalational exposure, emphysema or pulmonary fibrosis, a family or personal history of lung cancer, upper lobe location, larger size, and spiculated or irregular margins. Growth on serial imaging outweighs every static feature — a nodule that is enlarging needs action whatever its size.

REASSURING, AND THE PET CAVEAT

Benign calcification patterns — central, laminated, popcorn or diffuse — and fat within the nodule, which indicates a hamartoma. Perifissural or juxtapleural triangular nodules are usually intrapulmonary lymph nodes and need no follow-up. PET/CT is unreliable below about 8 mm and gives false negatives in ground-glass and low-grade adenocarcinoma, and false positives in infection and inflammation — so a negative PET does not clear a subsolid nodule.

PEARLS & PITFALLS

- **Hunt for prior imaging first.** Two years of stability in a solid nodule ends the pathway before it starts.
- **Do not apply Fleischner to screening, cancer patients, the immunosuppressed, or the under-35s.** Each needs a different framework.
- **Above 8 mm the guideline stops watching and starts characterizing** — CT at 3 months, PET/CT, or biopsy.
- **Measure the same way every time.** Mixing diameter and volumetry creates growth that is not there.
- **A negative PET does not clear a ground-glass nodule.** Low-grade adenocarcinoma is characteristically PET-negative.
- **Communicate the plan explicitly** and make sure someone owns the follow-up. Incidental nodules are lost to follow-up more often than they are misinterpreted.

References: Fleischner Society 2017 guidelines for management of incidental pulmonary nodules detected on CT images (*Radiology*

) · BTS guidelines for the investigation and management of pulmonary nodules · Lung-RADS for screening-detected nodules.

Educational aid; verify against local radiology and respiratory protocol and patient factors.

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