The Solitary Pulmonary Nodule*

Bethany B. Tan, MD; Kevin R. Flaherty, MD; Ella A. Kazerooni, MD and Mark D. Iannettoni, MD, FCCP

Correspondence to: Mark D. Iannettoni, MD, FCCP, University of Michigan Section of Thoracic Surgery, 2120 Taubman Center, Box 0334, 1500 E Medical Center Dr, Ann Arbor, Michigan 48109; e-mail: mdi@umich.edu

Summary of Recommendations

- 1. For patients with an **SPN** that is visible on CXR, all previous CXRs should be reviewed. Level of evidence, poor; benefit, substantial; grade of recommendation, C
- 2. For all patients with previous CXRs, an SPN that is unchanged for > 2 years does not require further diagnostic evaluation. Level of evidence, fair; benefit, substantial; grade of recommendation, B
- 3. For patients with an **SPN** visible on CXR in which benign central calcification is present, no further diagnostic evaluation is necessary. Level of evidence, good; benefit, substantial; grade of recommendation, A
- 4. For patients with an **SPN**, a spiral CT of the chest with contrast is indicated to better characterize the nodule, parenchyma, and mediastinum. CT can be useful in identifying nodules more likely to be benign and obviate the need for further diagnostic evaluation. Additionally, chest CT plays an important role in staging (as delineated in the chapter on noninvasive staging elsewhere in these guidelines). Level of evidence, good; benefit, moderate; grade of recommendation, B
- 5. For patients with an SPN, MRI is not indicated except in these special instances. Level of evidence, good; benefit, none; grade of recommendation, D
- 6. For patient with an **SPN** < 1 cm in size, PET scanning is not currently recommended. Level of evidence, good; benefit, none/negative; grade of recommendation, D
- 7. For patients with an **SPN** who are surgical candidates and have a negative mediastinal evaluation on CT, PET scanning with FDG as an investigational tool, where available, may be warranted. Level of evidence, fair; benefit, moderate; grade of recommendation, B
- 8. For patients with an **SPN** who are marginal surgical candidates, if PET scanning with FDG results are negative, a repeat CT scan is required at least once in 3 months. Level of evidence, poor; benefit, substantial; grade of recommendation, C
- 9. For patients with an **SPN** who are marginal surgical candidates, if there are unchanged results from prior CXR and negative PET scan findings, serial follow-up is recommended, consisting of an initial CXR, and CT scanning at 3, 6, 12, and 24 months. Level of evidence, fair; benefit, substantial; grade of recommendation, B

^{*} From the University of Michigan Section of Thoracic Surgery, Ann Arbor, MI.

- 10. For the patients with an **SPN** who are operable candidates, TTNA is not indicated. Level of evidence, good; benefit, none; grade of recommendation, D
- 11. For operable patients with an **SPN** who decline surgical intervention, TTNA or transbronchial needle biopsy is the preferred procedure for establishing a diagnosis. Level of evidence, fair; benefit, substantial; grade of recommendation, B
- 12. For patients with an **SPN** who are not operable candidates, or are at high risk, TTNA may be helpful to establish tissue diagnosis. Level of evidence, good; benefit, moderate; grade of recommendation, B
- 13. For patients with an **SPN**, bronchoscopy is usually not indicated. Level of evidence, good; benefit, none; grade of recommendation, D
- 14. For operable patients with an **SPN**, if the lesion is amenable to a wedge resection, then a wedge resection is the procedure of choice followed by a lobectomy if the pathologic finding is positive for cancer. Level of evidence, fair; benefit, substantial; grade of recommendation, B
- 15. For operable patients with an **SPN**, if the lesion is not amenable to a wedge resection, a diagnostic lobectomy is acceptable. Level of evidence, good; benefit, substantial; grade of recommendation, A
- 16. All pulmonary resections, anatomic or nonanatomic, must include a systematic lymph node dissection. Level of evidence, good; benefit, substantial; grade of recommendation, A
- 17. For patients with an **SPN** who are marginal surgical candidates, a wedge resection or segmentectomy is acceptable. Level of evidence, fair; benefit, substantial; grade of recommendation, B
- 18. For patients with an **SPN** without a definitive tissue diagnosis, a minimum follow-up of 2 years is recommended. This should include an initial CXR, and CT scanning at 3, 6, 12, and 24 months. Level of evidence, poor; benefit, moderate; grade of recommendation, C

Footnotes

Abbreviations: CXR = chest radiograph; FDG = 18-fluorodeoxyglucose; NSCLC = non-small cell lung cancer; PET = positron emission tomography; **SPN** = solitary pulmonary nodule; TTNA = transthoracic needle aspiration