**Practice Guideline**

**American College of Chest Surgeons:**

In patients with a low to moderate pre-test probability of malignancy (5% - 60%) and an indeterminate SPN that measures at least 8 to 10 mm in diameter, fluorodeoxyglucose (FDG) positron emission tomography (PET) should be performed to characterize the nodule.

When the pre-test probability of malignancy is moderate to high (>60%), and the nodule is hypermetabolic by FDG PET, surgical diagnosis is preferred when clinically appropriate (6).

**Background:**

The prevalence of non-calcified pulmonary nodules in smokers or ex-smokers is 23% - 69%, but only 1.4% - 2.7% have malignant nodules. The Fleischner Society has published imaging guidelines for patients with pulmonary nodules that are smaller than 8 mm (1).

PET/CT is more accurate than CT alone for characterizing pulmonary nodules, resulting in fewer equivocal findings, and higher specificity (2). Low to intermediate risk nodules ≥ 8 mm should be evaluated by PET/CT, whereas high-risk nodules should be biopsied or excised.

The sensitivity of PET/CT for lung cancer is >90%, so low to intermediate risk nodules that are metabolically inactive can be followed radiographically to ensure stability or resolution. The specificity of PET/CT is approximately 80% because inflammatory nodules can be metabolically active (3). PET positive nodules require further investigation.

PET/CT with 18F-fluorodeoxyglucose (FDG) has been shown to be cost-effective for characterizing lung nodules ≥ 8 mm when risk-estimates based on clinical versus morphological parameters are conflicting, or when indeterminate nodules are found in high-risk individuals (4).

SNM recommends that 18F-FDG PET/CT should routinely be obtained in the diagnostic work-up of solitary pulmonary nodule (5). Imaging will improve health care outcomes, mostly by avoiding futile surgeries in low-risk patients and enabling curative surgeries in high-risk patients.

**Value of PET/CT**

**Diagnosis of Pulmonary Nodules**

Core Message for Referring Physicians

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**Case Example 1:**

47-year-old man with incidental 1.5 cm nodule discovered on chest x-ray. PET/CT showed high FDG uptake. Biopsy showed poorly differentiated lung cancer.

**Case Example 2:**

84 year-old man with chronic cough and 1.5 cm nodule on chest x-ray. PET/CT showed no FDG uptake. Biopsy was deferred. The nodule had grown to 2 cm 12 months later. Biopsy showed a fungus.

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Quantitative criteria have been suggested to improve the accuracy of PET/CT. The standardized uptake value (SUV) is a ratio of the concentration of FDG in the nodule compared to the average concentration in the body. An SUV of 2.5 has been used to differentiate benign from malignant nodules. Many variables, however, affect the measurement of SUV, limiting its accuracy and reproducibility. It has been suggested that an increase or no change in SUV when measured at two time points between 60 to 120 minutes improves accuracy (7). Despite the appeal of a simple numerical measurement, most physicians rely on visual assessment of metabolic activity using a binary decision model of detectable versus no detectable FDG uptake.

References