

PET and lung

Lung cancer

Lung cancer is the most common and one of the most lethal forms of cancer, accounting for one third of all cancer deaths annually in the U.S. Annually there are approximately 180,000 new cases in the U.S. Lung cancer has the most rapidly increasing incidence in industrialized countries due largely to smoking, although some adenocarcinomas are unrelated. Other risk factors include exposure to asbestos, radiation, specific chemicals, and air pollution. The most common types of lung cancer include small-cell carcinoma (20 percent of total), squamous-cell carcinoma (25-30 percent of total), and adenocarcinoma and large-cell carcinoma (50 percent of total). Chest X-rays and CT studies are the initial diagnostic studies.

Solitary Pulmonary Nodules (SPNs)

SPNs present compelling diagnostic challenges in that patients are asymptomatic with respect to the nodule, the physical exam is normal, and CBC and liver function tests are normal. SPNs require a diagnostic strategy that maximizes the chance of determining malignancy while simultaneously minimizing the risk of performing a needless thoracotomy.

Non-small Cell Lung Cancer (NSCLC)

The preferred treatment for NSCLC is surgery. Key questions are resectability and operability. Approximately 20 to 25 percent of patients with NSCLC present both operable and resectable. Five-year survival is 12 percent of all NSCLC patients, and 25 percent of operable patients. Inoperable patients receive chemotherapy or radiation. Small-cell carcinoma is generally not treated surgically due both to its aggressive progression and positive initial response to chemotherapy and radiation.

Role of PET

PET complements traditional diagnostic tests such as chest X-rays and CT studies. Sensitivity for detecting lung cancer increases from 66 percent with CT alone to 95 percent in combination with PET. PET can aid with accurate and timely diagnosis, staging, assessing recurrence, and monitoring response to therapy.

Reimbursement for PET

PET studies are reimbursable within the Medicare program for the characterization of solitary pulmonary nodules, as well as for the diagnosis, staging, and re-staging of NSCLC. Please consult your local PET center for additional information regarding reimbursement by Medicare and private insurers.

Source for cancer facts and figures:

Manual of Medical Therapeutics: The Washington Manual, 27th Edition, 1993.

Manual of Clinical Oncology, 3rd edition, 1995.

Scan protocol:

Dose: 6.0 mCi 18F-FDG inj. i.v

Patient weight: 40.9 kg (90 lbs)

Emission scan: 3 min/bed position

Low dose CT performed for PET attenuation correction and localization (parameters: mAs: 15, kVp: 140)

PET/CT findings:

PET/CT reveals lesion in the upper lobe of the left lung.

Relevant articles and papers on lung cancer:

1. Schiepers C, Yap CS, Silverman DH, et al. Staging of newly diagnosed lung cancer: impact of FDG-PET on patient management [abstract]. *J Nucl Med.* 2000;41:109P.
2. Gupta NC, Graeber GM, Bishop HA, Raylman RR. Improved pre-operative staging of primary lung cancer by PET-FDG imaging [abstract]. *J Nucl Med.* 1997;38:243P-244P.
3. Hicks RJ, Binns D, Kalff V, et al. The utility of fluorine 18-fluorodeoxyglucose (FDG) positron emission tomography (PET) for restaging of non-small cell lung cancer (NSCLC): Analysis of management change and survival of 63 consecutive patients [abstract]. *J Nucl Med.* 2000;41:75P.

