tissue for analysis. Tumor tissue may be obtained via minimally invasive techniques such as bronchial or transbronchial biopsy during fiberoptic bronchoscopy, by fine-needle aspiration or percutaneous biopsy using image guidance, or via endobronchial ultrasound (EBUS) guided biopsy. Depending on the location, lymph node sampling may occur via transesophageal endoscopic ultrasound-guided biopsy (EUS), EBUS, or blind biopsy. In patients with clinically palpable disease such as a lymph node or skin metastasis, a biopsy may be obtained. In patients with suspected metastatic disease, a diagnosis may be confirmed by percutaneous biopsy of a soft tissue mass, lytic bone lesion, bone marrow, pleural or liver lesion, or an adequate cell block obtained from a malignant pleural effusion. In patients with a suspected malignant pleural effusion, if the initial thoracentesis is negative, a repeat thoracentesis is warranted. Although the majority of pleural effusions are due to malignant disease, particularly if they are exudative or bloody, some may be parapneumonic. In the absence of distant disease, such patients should be considered for possible curative treatment.

The diagnostic yield of any biopsy depends on several factors including location (accessibility) of the tumor, tumor size, tumor type, and technical aspects of the diagnostic procedure including the experience level of the bronchoscopist and pathologist. In general, central lesions such as squamous cell carcinomas, small-cell carcinomas, or endobronchial lesions such as carcinoid tumors are more readily diagnosed by bronchoscopic examination, whereas peripheral lesions such as adenocarcinomas and large-cell carcinomas are more amenable to transthoracic biopsy. Diagnostic accuracy for SCLC versus NSCLC for most specimens is excellent, with lesser accuracy for subtypes of NSCLC.

Bronchoscopic specimens include bronchial brush, bronchial wash, bronchioloalveolar lavage, transbronchial fine-needle aspiration (FNA), and core biopsy. For more accurate histologic classification, mutation analysis, or investigational purposes, reasonable efforts (e.g., a core needle biopsy) should be made to obtain more tissue than what is contained in a routine cytology specimen obtained by FNA. Overall sensitivity for combined use of bronchoscopic methods is approximately 80%, and together with tissue biopsy, the yield increases to 85–90%. Like transbronchial core biopsy specimens, transthoracic core biopsy specimens are also preferred. Sensitivity is highest for larger lesions and peripheral tumors. In general, core biopsy specimens, whether transbronchial, transthoracic, or EUS-guided, are superior to other specimen types. This is primarily due to the higher percentage of tumor cells with fewer confounding factors such as obscuring inflammation and reactive nonneoplastic cells.

Sputum cytology is inexpensive and noninvasive but has a lower yield than other specimen types due to poor preservation of the cells and more variability in acquiring a good-quality specimen. The yield for sputum cytology is highest for larger and centrally located tumors such as squamous cell carcinoma and small-cell carcinoma histology. The specificity for sputum cytology averages close to 100%, although sensitivity is generally <70%. The accuracy of sputum cytology improves with increased numbers of specimens analyzed. Consequently, analysis of at least three sputum specimens is recommended.

STAGING LUNG CANCER

Lung cancer staging consists of two parts: first, a determination of the location of the tumor and possible metastatic sites (anatomic staging), and second, an assessment of a patient's ability to withstand various antitumor treatments (physiologic staging). All patients with lung cancer should have a complete history and physical examination, with evaluation of all other medical problems, determination of performance status, and history of weight loss. The most significant dividing line is between those patients who are candidates for surgical resection and those who are inoperable but will benefit from chemotherapy, radiation therapy, or both. Staging with regard to a patient's potential for surgical resection is principally applicable to NSCLC.

ANATOMIC STAGING OF PATIENTS WITH LUNG CANCER

The accurate staging of patients with NSCLC is essential for determining the appropriate treatment in patients with resectable disease and avoiding unnecessary surgical procedures in patients with advanced disease (Fig. 107-3). All patients with NSCLC should undergo initial

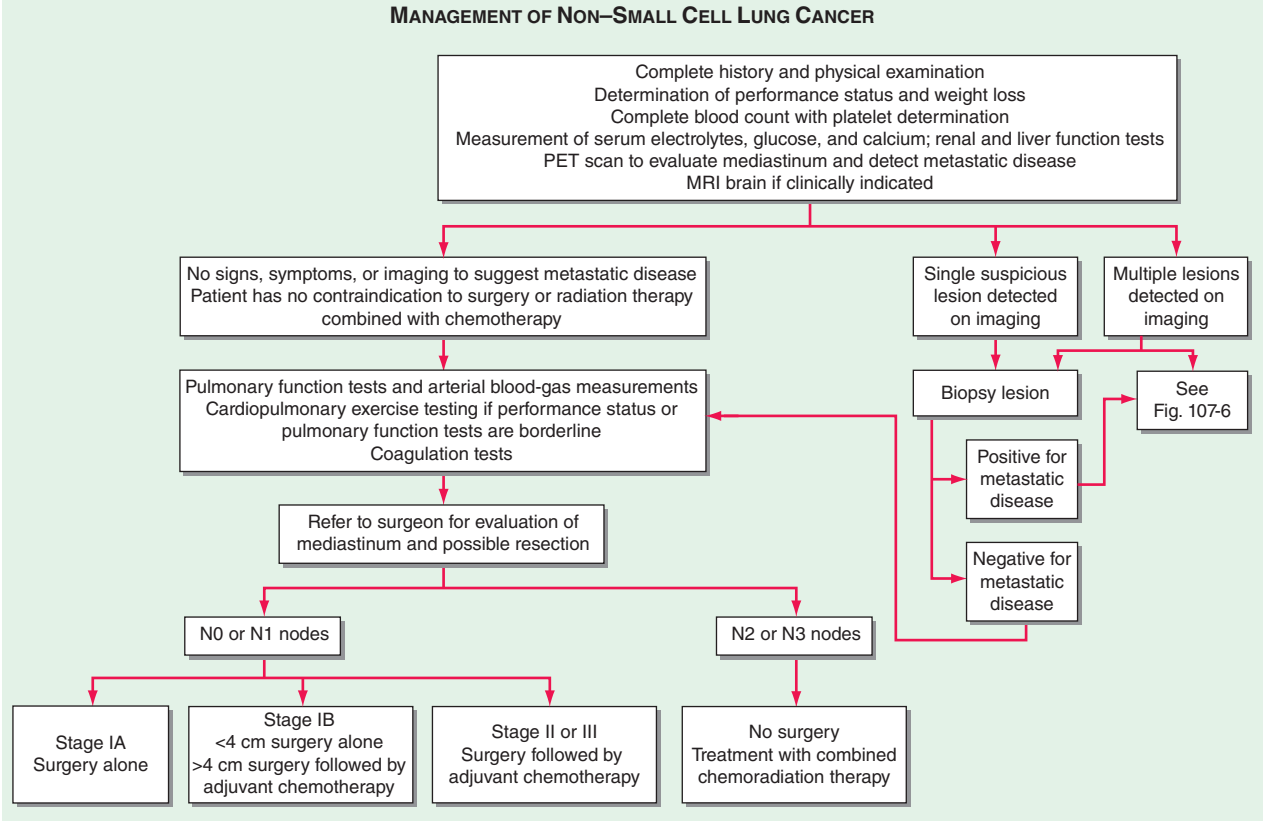

FIGURE 107-3 Algorithm for management of non-small-cell lung cancer. MRI, magnetic resonance imaging; PET, positron emission tomography.