

TABLE 23-1 LUNG CANCER STAGING SYSTEMS

STAGE	DESCRIPTION
TUMOR, NODE, METASTASIS STAGING SYSTEM FOR NSCLC	
Primary Tumor (T)	
TX	Primary tumor cannot be assessed, or tumor proved by the presence of malignant cells in sputum or bronchial washings but not visualized by imaging or bronchoscopy
T0	No evidence of primary tumor
Tis	Carcinoma in situ
T1	Tumor <3 cm in greatest dimension, surrounded by lung or visceral pleura, without bronchoscopic evidence of invasion more proximal than the lobar bronchus (i.e., not in the main bronchus)
T1a	Tumor <2 cm in greatest dimension
T1b	Tumor >2 cm but <3 cm in greatest dimension
T2	Tumor >3 cm but <7 cm or tumor with any of the following features (T2 tumors with these features are classified T2a if <5 cm): involves main bronchus, >2 cm distal to the carina or invades visceral pleura; associated with atelectasis or obstructive pneumonitis that extends to the hilar region but does not involve the entire lung
T2a	Tumor >3 cm but <5 cm in greatest dimension
T2b	Tumor >5 cm but <7 cm in greatest dimension
T3	Tumor >7 cm or one that directly invades any of the following: chest wall (including superior sulcus tumors), diaphragm, phrenic nerve, mediastinal pleura, parietal pericardium; tumor in the main bronchus <2 cm distal to the carina but without involvement of the carina; associated atelectasis or obstructive pneumonitis of the entire lung; separate tumor nodule(s) in the same lobe
T4	Tumor of any size that invades any of the following: mediastinum, heart, great vessels, trachea, recurrent laryngeal nerve, esophagus, vertebral body, carina; separate tumor nodule(s) in a different ipsilateral lobe
Nodal Involvement (N)	
NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Metastasis in ipsilateral peribronchial and/or ipsilateral hilar lymph nodes and intrapulmonary nodes, including involvement by direct extension
N2	Metastasis in ipsilateral mediastinal and/or subcarinal lymph node(s)
N3	Metastasis in contralateral mediastinal, contralateral hilar, ipsilateral or contralateral scalene, or supraclavicular lymph node(s)
Metastasis (M)	
MX	Distant metastasis cannot be assessed
M0	No distant metastasis
M1	Distant metastasis
M1a	Separate tumor nodule(s) in a contralateral lobe; tumor with pleural nodules or malignant pleural/pericardial effusion
M1b	Distant metastasis
VALG STAGING SYSTEM	
Limited-stage disease (LD)	Tumor confined to the ipsilateral hemithorax and regional lymph nodes, including ipsilateral supraclavicular nodes; can be encompassed within a tolerable radiation therapy port
Extensive-stage disease (ED)	Tumor has spread beyond the boundaries of LD, including malignant pleural or pericardial effusions, contralateral hilar or supraclavicular involvement or distant metastases

Modified from Edge S, Byrd DR, Compton CC, et al, editors: AJCC cancer staging manual, ed 7, New York, 2010, Springer.
NSCLC, Non-small cell lung carcinoma; VALG, Veterans Administration Lung Study Group.

lung cancer for surgical resection, regardless of age (grade 1C recommendation). The presurgical evaluation of patients with lung cancer involves staging, the determination of resectability, and the evaluation of lung function to determine pulmonary reserve. Given the high occurrence of comorbid conditions that increase the likelihood of an adverse perioperative cardiovascular event, a preoperative cardiologic evaluation may be warranted (grade 1C).

A comprehensive respiratory assessment can estimate the preoperative risk from underlying pulmonary disease, such as chronic obstructive pulmonary disease (COPD). Spirometry to ascertain pulmonary function (i.e., forced expiratory volume in 1 second [FEV₁]) is commonly used to assess the suitability of patients with lung cancer for surgery. Patients with an FEV₁ value greater than 2 L (for pneumonectomy), greater than 1.5 L (for lobectomy), or greater than 80% predicted have an average preoperative risk (grade 1C).

Measurement of the lung's carbon monoxide diffusion capacity (DLCO) is necessary for patients with an acceptable FEV₁ value but who have unexplained dyspnea on exertion or evidence

of interstitial lung disease on chest imaging. If the measured DLCO is greater than 80% predicted, the patient is still considered to have an average preoperative risk. Radionuclide perfusion scanning and cardiopulmonary exercise testing may be performed when spirometry and DLCO are borderline, conflicting, or otherwise difficult to interpret and apply to the patient's functional status (grade 1B recommendation).

Non-Small Cell Lung Carcinomas

Surgery is the only curative therapy for NSCLCs, and it is indicated for patients with stage I or II disease who are operative candidates (grade 1B recommendation). Lobectomy is considered superior to wedge resection (grade 1B). Pathologic stage IA or IB disease does not require additional therapies (grade 1B). Adjuvant chemotherapy is appropriate for patients with stage II or greater disease (grade 1A).

For patients with stage IIIA disease, the optimal treatment strategy remains unclear. These patients usually are not candidates for surgery or radiation therapy alone (grade 1A recommendation), and a treatment plan should be individualized in a

