Staging Lung Cancer
Regional Lymph Node Classification

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KEYWORDS

• Lung cancer • Staging • Lymph node • Lymph node map
• International association for the study of lung cancer (IASLC)

KEY POINTS

- N descriptor refers to absence or presence of regional nodal metastatic disease.
- Regional lymph node maps have been created to standardize the assessment of the N descriptor for lung cancer.
- According to the eighth edition of the tumor-node-metastasis staging system for lung cancer, the International Association for the Study of Lung Cancer lymph node map is to be used for the standardization of N descriptor assessment.

INTRODUCTION

In the tumor-node-metastasis (TNM) staging system for lung cancer, the N descriptor refers to the absence or location of cancer spread to a regional lymph node.[1] Lung cancer spread to a nonregional lymph node is considered a distant metastasis (M descriptor in the TNM staging system).[1]

In the eighth edition of the TNM staging system, the N descriptors used in the seventh edition are unchanged because they adequately predict prognosis. The principle has been maintained that the nodal descriptors be based on the anatomic location of the metastatic lymph node in the thorax and not on the number of metastatic lymph nodes (nN). Even though the number of involved nodal stations has prognostic impact on pathologic lymph node(pN) staging, this has not been validated for clinical lymph node staging (cN) and, hence, is not a recommendation in the eighth edition. It is recommended, however, that the nN (or stations) be recorded.

The clinical determination of the N descriptor requires a multimodality approach. Computed tomography (CT), positron emission tomography/computed tomography (PET/CT) with fluorodeoxyglucose (FDG), esophageal ultrasound (EUS) and/or endobronchial ultrasonography (EBUS), and mediastinoscopy are the common modalities used to clinically determine the N descriptor. This review discusses the N descriptors in the eighth edition of the TNM staging system for lung cancer, the anatomic definitions for describing regional lymph nodes, and the various imaging and invasive techniques for tissue sampling.

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Radiol Clin N Am 56 (2018) 399–409
https://doi.org/10.1016/j.rcl.2018.01.008
0033-8389/18/Published by Elsevier Inc.

INTERNATIONAL ASSOCIATION FOR THE STUDY OF LUNG CANCER LYMPH NODE MAP DEFINITIONS SETS

The location of regional nodal metastasis is important when determining treatment and prognosis.[1] Accordingly, regional lymph node maps have been created to standardize the assessment of the N descriptor. In these maps, lymph nodes are labeled using a system of numerical levels and assigned names based their anatomical location. The first lung cancer lymph node map was created by Naruke and colleagues.[2,3] Subsequently the American Thoracic Society, and the Mountain-Dresler modification of the American Thoracic Society lymph node map were also used to describe nodal metastases.[4–6] Because the discrepancy between the maps resulted in an overall discordance of 31.5% in the assessment of the N descriptor, the International Association for the Study of Lung Cancer (IASLC) proposed a new lymph node map to reconcile the differences among the maps.[7] The IASLC lymph node map is used in the eighth edition of the TNM staging system and defines 14 regional lymph node stations (**Figs. 1–7**).[6]

REGIONAL LYMPH NODE (N) CLASSIFICATION

In lung cancer, the N descriptor in the TNM staging system is classified as N0, N1, N2, N3, or NX. N0 refers to the absence of lung cancer spread to a regional lymph node. N1 refers to lung cancer spread to 1 or more ipsilateral hilar, interlobar, lobar, and segmental and/or subsegmental lymph nodes. N2 refers to lung cancer spread to ipsilateral mediastinal and/or subcarinal lymph nodes (**Fig. 8**). N3 refers to lung cancer spread to contralateral mediastinal, hilar, interlobar, lobar, segmental, subsegmental lymph nodes and/or to contralateral or ipsilateral low cervical, supraclavicular, or sternal notch lymph nodes. NX refers

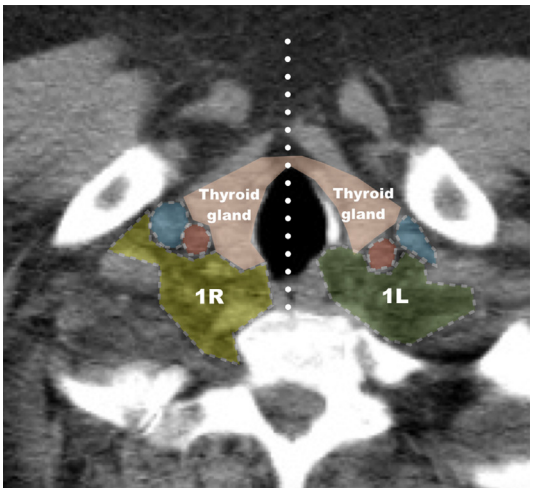

Fig. 1. Stations 1R and 1L. Axial CT image below the level of the cricoid cartilage and above the level of the manubrium. The midline of the trachea (*dotted white line*) separates station 1R (*yellow area*) from station 1L (*green area*). Red and blue indicate arterial and venous structures, respectively.

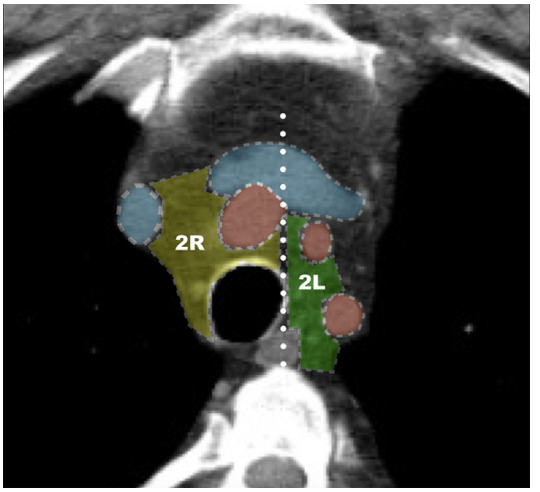

Fig. 2. Stations 2R and 2L. Axial CT image below the level of the apex of the lungs, and above the level where the caudal margin of the left innominate vein intersects with the trachea. The left lateral wall of the trachea (*dotted white line*) separates station 2R (*yellow area*) from station 2L (*green area*). Red and blue indicate arterial and venous structures, respectively.

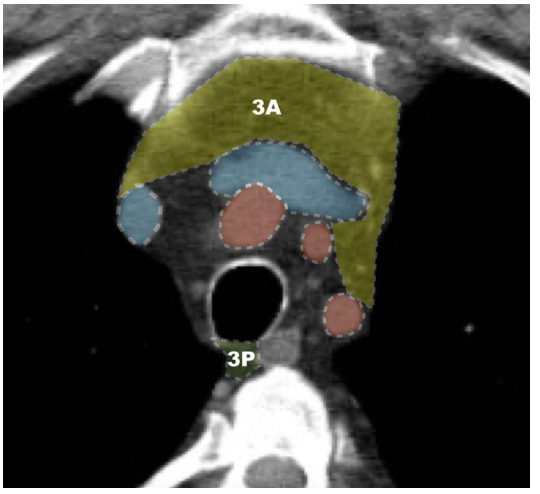

Fig. 3. Stations 3a and 3p. Axial CT image below the level of the apex of the chest and above the level of the carina demonstrates station 3a (*yellow area*) and station 3p (*green area*). Red and blue indicate arterial and venous structures, respectively.