

## Non-Small Cell Lung Cancer (NSCLC) Backgrounder

Lung cancer is the second-most common cancer among men and women in the United States and the leading cause of cancer-related death.<sup>1</sup> Every two and half minutes someone in the U.S. is told they have lung cancer.<sup>2</sup> Lung cancer starts in cells of the lung and almost all such cancers are carcinomas. Lung carcinomas are divided into two groups based on how the cells look. One group is called small cell lung cancer and the other group is called non-small cell lung cancer (NSCLC). About 85 out of 100 patients with lung cancer have NSCLC.<sup>3</sup>

### Symptoms and Causes

Like most cancers, early stage disease in NSCLC rarely causes symptoms that lead individuals to seek medical attention. However, as the disease progresses, the experience and severity of symptoms can be completely different from person to person. Factors that influence symptom severity are the same factors that determine diagnosis and include tumor location, size, how far it has progressed and how the patient is responding to the tumor. Many believe that lung cancer is caused by smoking, however lung cancer is not a disease strictly for smokers. While smoking does put an individual at higher risk for lung cancer, 30,000 U.S. non-smokers were diagnosed in 2018.<sup>4</sup> Other environmental factors and genetics also lead to cancer, including NSCLC.

### Diagnosis and Staging

Once a tumor is identified in the lung(s), doctors will make a diagnosis by performing imaging tests and/or obtaining tissue or fluid from the mass itself or from abnormal lymph nodes. There is no single plan for diagnosis that is best for all patients. The diagnosis plan will depend on the tumor's size, where the cancer is located, the patient's health, and doctor experience. Once a diagnosis is made, a cancer stage is determined based on tumor characteristics and how far the cancer has spread throughout the body. The chance of successful or curative treatment is much higher when lung cancer is diagnosed and treated in the early stages, before it spreads. Unfortunately, because lung cancer doesn't cause obvious symptoms in the earlier stages, diagnosis often comes after it has spread. Recent data show that approximately 84% of lung cancers are diagnosed at later stages.<sup>5</sup>

### Tumor Molecular Profiling

Medical guidelines recommend that molecular testing should be carried out in blood or tissue from patients with NSCLC to guide treatment decisions for the selection of targeted therapies. The discovery of predictive biomarkers has improved the ability to better manage patient care more effectively and improve overall outcomes.<sup>6</sup> Molecular tests, such as the blood-based Biodesix Lung Reflex<sup>®</sup>, examine genes or their products (proteins) associated with lung cancer.

### Treatment Plan

Cancer can greatly differ from patient to patient even when their tumor is in the same organ and location. Doctors use pathology results, overall health and mobility to assign a performance status score for each patient and other clinical factors to assess overall prognosis. A prognosis is a prediction of the pattern and outcome of a disease which may affect what the physician and patient decides about treatment. Based on this evaluation and other diagnostic test results, a doctor can tell the type of lung cancer and

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<sup>1</sup> Siegel R, Miller K, Jemal A. Cancer Statistics 2018. *CA Cancer J Clin* 2018;68:7-30.

<sup>2</sup> About Lung Cancer. Lung Cancer Foundation of America website. <http://www.lcfamerica.org/lung-cancer-is-a-very-common-disease/>. Accessed September 27, 2016.

<sup>3</sup> Non-Small Cell Lung Cancer Treatment (PDQ<sup>®</sup>)—Patient Version – Stages of Non-small cell lung cancer. National Cancer Institute website. <https://www.nccn.org/patients/guidelines/lung-nsccl/index.html>. Accessed November 29, 2018.

<sup>4</sup> Lung Cancer Risks for Non-smokers. American Cancer Society. <https://www.cancer.org/latest-news/why-lung-cancer-strikes-nonsmokers.html>. Accessed January 2, 2019.

<sup>5</sup> U.S. National Institute Of Health, National Cancer Institute. SEER Cancer Statistics Review, 1975–2015.

<sup>6</sup> Non-small cell lung cancer. NCCN Clinical Practice Guidelines in Oncology. Version 2.2019-November 31, 2018.

provide a prognosis and treatment plan. Treatment options can include surgery, radiation chemotherapies, therapies that target specific tumor mutations, immunotherapies, best supportive care, or enrollment into clinical trials.

### **Life expectancy**

Once cancer enters the lymph nodes and bloodstream, it can spread anywhere in the body. The outlook is better when treatment begins before cancer spreads outside the lungs.

Other factors include age, overall health, and how well the patient responds to treatment. Because early symptoms can be easily overlooked, lung cancer is usually diagnosed in later stages.

Survival rates and other statistics provide a broad picture of what to expect. However, each cancer is different and life expectancy is based on significant individual differences. In recent years, new treatments have been approved for stage 4 NSCLC. Some people are surviving much longer than previously seen with traditional treatments.