

# Oncogenic-Directed Therapy for Advanced Non-Small Cell Lung Cancer: Implications for the Advanced Practice Nurse

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Molecular profiling and testing for oncogenic driver mutations is an essential component in the diagnosis of patients with advanced non-small cell lung cancer (NSCLC). Results of these tests guide personalized targeted therapy in patients with NSCLC harboring an oncogenic driver. Advanced practice nurses are at the center of coordinating care for patients with NSCLC from the time of diagnosis and have a role in assuring appropriate testing is ordered and therapy is selected based on testing results.

## AT A GLANCE

- Oncogenic driver mutation tests allow for precise diagnoses and treatment plans in NSCLC.
- Keeping abreast of clinical practice guidelines helps to ensure the proper tests are done, revealing genetic markers that guide the trajectory of treatments.
- Advanced practice nurses must understand lung cancer genomics to educate patients about the importance of testing and explain the treatments based on results.

## KEYWORDS

non-small cell lung cancer; molecular profiling; oncogenic drivers

## DIGITAL OBJECT IDENTIFIER

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Lung cancer is the world's leading cause of cancer-related deaths, totaling 18.4% of all cancer deaths, and non-small cell lung cancer (NSCLC) makes up 85% of all lung cancer diagnoses (Sung et al., 2021). In the United States, it is estimated that there will be 236,740 new cases diagnosed and 130,180 deaths related to lung cancer in 2022 (American Cancer Society [ACS], 2022). More than 75% of lung cancer cases are diagnosed at an advanced stage, which precludes curative treatments and is associated with a poor prognosis (ACS, 2022). The rates of lung cancer deaths have steadily declined since the early 2000s because of the reduction in smoking, which translates to an approximate 5% reduction in lung cancer-related deaths in recent years because of treatment advances (ACS, 2022).

Histologic subtyping, oncogenic driver testing, and analysis of tumor programmed cell death-ligand 1 (*PD-L1*) expression are critical to the diagnosis of NSCLC. Cytotoxic chemotherapy has been the foundation of treatment for advanced NSCLC based on histology (e.g., nonsquamous and squamous cell carcinoma), with a 20% survival rate. However, the treatment landscape for NSCLC has evolved rapidly since about 2007 with advances in diagnostic evaluation of genomic biomarkers. NSCLC is associated with several somatic genome alterations known as “driver mutations” (Kerr et al., 2021; Subramanian, 2020) (see Table 1). These mutations occur in cancer cells within genes that encode proteins for cell growth, invasion, and survival. Patients with stage IV NSCLC harboring a targetable mutation have improved overall survival when treated with a targeted therapy versus those with a mutation who do not receive targeted therapy (Kalemkerian et al., 2018; Kris et al., 2014; Sequist & Neal, 2022). In addition, *PD-L1* and tumor mutation burden can predict favorable response to checkpoint inhibitors in NSCLC (Bodor et al., 2020).

## Practice Guidelines

Advanced practice nurses (APNs) are critical to the interprofessional care of patients with NSCLC. It is essential that they keep abreast of consensus clinical practice guidelines that recommend the adoption of routine testing for driver mutations for all newly diagnosed advanced stages of NSCLC. While targetable mutations are more common in adenocarcinoma, 5%–10%