Below is a synopsis of important, recently published research supporting adoption of comprehensive biomarker testing in non-small cell lung cancer (NSCLC). LUNGevity maintains a website that collates the most high impact papers and provides brief synopses for busy providers and hospital administrators.

View more research on the LUNGevity Clinical Value of Biomarker Testing webpage

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Missed Targets in NSCLC: The Hidden Gaps in Molecular Testing

Voruganti, et al. *JCO Oncol Pract.* 2026

The Illusion of Comprehensive Testing in NSCLC: Gaps in Coverage, Sensitivity, and Reporting copyright by American Society of Clinical Oncology

By examining existing literature and prior studies, this article addresses the misconception that all molecular tests labeled as "comprehensive" in non–small cell lung cancer (NSCLC) provide complete and accurate genomic profiling. The authors highlight that although precision oncology depends on identifying actionable mutations, present in roughly 35%–45% of patients, significant variability exists across testing platforms. Differences in gene coverage, the ability to detect certain alterations (particularly fusions and splice variants), and reliance on DNA-only assays can result in missed clinically relevant mutations. Additionally, inconsistent use of complementary approaches such as RNA sequencing, immunohistochemistry, and liquid biopsy further contributes to incomplete testing, ultimately risking suboptimal treatment selection.

The commentary systematically outlines key deficiencies in current molecular testing practices, focusing on three major problem areas: inadequate gene coverage, limited assay sensitivity, and inconsistent or unclear reporting. By comparing available testing platforms and discussing real-world limitations, the authors demonstrate how these gaps can lead to false-negative results or omission of important biomarkers such as MET exon 14 skipping alterations, NTRK fusions, STK11, and KEAP1. The article also emphasizes the importance of interpreting negative results cautiously, incorporating tissue adequacy

statements, and using reflex or complementary testing strategies (e.g., RNA-based sequencing or plasma-based assays). In doing so, it reframes “comprehensive testing” as a more nuanced and evolving concept rather than a standardized reality.

Overall, the findings underscore that the greatest barrier to precision oncology in NSCLC is not the lack of effective targeted therapies, but inconsistent and incomplete molecular testing that limits patient access to them. The authors stress the need for standardized definitions of comprehensive testing, improved assay design (including both DNA and RNA components), clearer and more clinically meaningful reporting, and ongoing clinician education. They also highlight the importance of multidisciplinary collaboration between oncologists and pathologists to ensure appropriate test selection and interpretation. They claim that achieving the full potential of precision medicine requires advanced therapies alongside high-quality, accurate, and transparent diagnostic testing.

Read the full research study: Illusion of Comprehensive Testing in Non–Small Cell Lung Cancer: Why Coverage, Sensitivity, and Reporting Matter

View more research on the LUNGevity Clinical Value of Biomarker Testing webpage