



Missed Opportunities in Precision Oncology: Why Are Genomic Tests Still Underused?

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Abstract

Despite the transformative impact of genomic profiling in oncology, a substantial proportion of cancer patients worldwide do not undergo molecular testing that could guide optimal treatment decisions [1,2]. This gap persists across tumor types and healthcare systems, including high-income countries [3,4]. The causes are multifactorial and include economic constraints, infrastructure limitations, variability in physician awareness, and systemic inequities [3,5,6]. Increasingly, failure to perform genomic testing is no longer neutral, but may represent deviation from standard-of-care.

Keywords: Oncology; Cancer

Introduction

Precision oncology has reshaped cancer care. Molecular profiling is now central in tumors such as NSCLC, breast, and colorectal cancer, where biomarkers directly guide therapy selection [1,3,4,7]. However, real-world evidence shows many patients are not tested or are tested too late [5,8,9]. This disconnect represents a major implementation failure.

The scope of the problem

Underutilization occurs even in high-income systems. Studies show incomplete adherence to testing guidelines, delays, and disparities between academic and community settings [5,8,9]. Socioeconomic and geographic factors further amplify inequities [3,6].

Why are genomic tests not performed?

Economic barriers remain central, with inconsistent reimbursement limiting access [3,6]. Infrastructure challenges, including tissue availability and turnaround times, further restrict testing [2,3]. Knowledge gaps and lack of multidisciplinary support impair implementation. Delayed testing is a critical issue, often eliminating therapeutic opportunities [5,9].

Malpractice or system failure?

In well-resourced environments, omission of genomic testing may represent deviation from accepted standards [2,3,9]. In contrast, in constrained systems, the issue reflects structural limitations rather than individual fault [3,6]. Nevertheless, accountability is increasing as genomic testing becomes standard practice.

Clinical consequences

Failure to test leads to missed targeted therapies, worse outcomes, and exclusion from trials [1,4,7,9,11]. Real-world data confirm improved survival when testing is performed appropriately [9].

Strategies to close the gap

Solutions include reimbursement reform, clinician education, technological advances such as liquid biopsy, and standardized workflows like reflex testing [2,3,6,10].

Conclusions

Underutilization of genomic testing represents a critical failure in modern oncology. Ensuring access is an essential component of standard care.

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