

Why Community-Based Hospitals Are Bringing Next Generation Sequencing In-House

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The rapidly growing number of targeted immunotherapies in development has led to demand for faster, more accurate approaches to molecular profiling. The ability of next generation sequencing (NGS) to meet this need has positioned it as a key enabler for the pharmaceutical industry's emerging cancer treatments [1]. What began as a revolutionary research tool a decade ago has emerged as the platform of choice for clinical researchers and clinicians looking to advance the way they understand patients' diseases and, more importantly, how to treat them.

In cancer, NGS can reveal precise data about a tumor's genetic makeup, allowing clinicians to match patients with targeted treatments. As recently as five years ago, however, NGS was just making its way out of research labs and not quite ready for routine use at community hospitals. To get an NGS report, clinicians had to relinquish control and send patient tumor samples for analysis to a reference lab, a process that takes weeks and has a high failure rate [2]. Today, any certified community hospital can perform NGS, and many are in the process of embracing it to save valuable time and money, as well as improve outcomes for patients.

Patients and clinicians benefit

Bringing NGS analysis in-house helps hospitals overcome the fundamental problem with outsourced testing—the long waiting period for results, which is stressful for both the ordering

clinician and the patient. Faster turnaround times are critical for effective cancer treatment decisions, particularly for late-stage patients who don't have time to spare. In a recent survey, 76 percent of oncologists responded that improvement in turnaround times would directly lead to improved patient care [3]. While commercial labs can take up to 20 days [4] or more to deliver results—at which point they may no longer be valid or helpful—in-house NGS can produce results in as little as six days [5]. This expedited path to clinically relevant data enables clinicians to more quickly select the most appropriate targeted therapy and enable better health outcomes.

Bringing NGS testing in-house also supports stronger stewardship of patient samples and tighter adherence to sequencing protocols to reduce errors and ensure that patients' genomic data remains within the hospital, rather than be given away to commercial reference labs. Retaining this critical information protects patient privacy, helps build the hospital's database for further studies, and increases institutional knowledge that can inform treatment for future patients with similar cancers, creating intrinsic added value for clinicians.

Patients also benefit from the stronger collaboration that naturally occurs between pathologists and clinicians when NGS testing is brought in-house. Hospitals now commonly form molecular tumor boards in which

oncologists, molecular pathologists, and staff meet to formulate the best treatment options for each patient. The board provides a forum in which oncologists can ask questions about a patient's particular gene mutation to gain information that will impact prognosis or the selection of therapy. Similarly, the pathologist becomes part of the patient's care team (rather than just the issuer of a written report) and learns how NGS results inform clinical research and treatment. The dialogue creates a unique environment for professional development that ultimately leads to better patient care, furthers cancer clinical research, and concretely advances the promise of precision medicine.

As demand for molecular profiling increases, in-house NGS testing makes economic sense for local hospitals. A recent University Hospitals Cleveland Medical Center study [6] on late-stage non-small cell lung cancer patients demonstrated how in-house NGS helped clinicians identify a broader set of actionable drug targets in half the time recommended by National Comprehensive Cancer Network (NCCN) guidelines—at no additional cost to the hospital. Another study [5] led by a team of clinical researchers from Heidelberg University Hospital found that compared to sequential single-gene testing, NGS offered higher reliability, lower dropout rates, minimal tissue requirements, faster turnaround times, and lower cost.

A growing trend

While recent studies unquestionably prove the value of in-house NGS testing, we are already seeing real-world examples of this trend globally, driven primarily by the lower cost to implement NGS and its ease of use. Access to NGS testing in this initial clinical phase has been limited to large academic medical centers, but more community-based hospitals and government healthcare agencies are changing that paradigm, including the Veterans Affairs (VA) of Greater Los Angeles Health System, Sentara Health in Virginia, and Sonora Quest in Arizona [7], among others.

Growing demand for molecular profiling, along with the rapid maturation and accessibility of NGS technology and the availability of more effective targeted therapies, is enabling oncologists and clinician teams to leverage an opportunity never seen before in the medical field. Ultimately, this era of precision oncology will continue evolving as clinical research expands the field's knowledge and new tests for in-house analysis come online. The expectation is that this forward momentum will continue to help improve outcomes for patients who need it most, and to provide access to the technology that enables it.

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