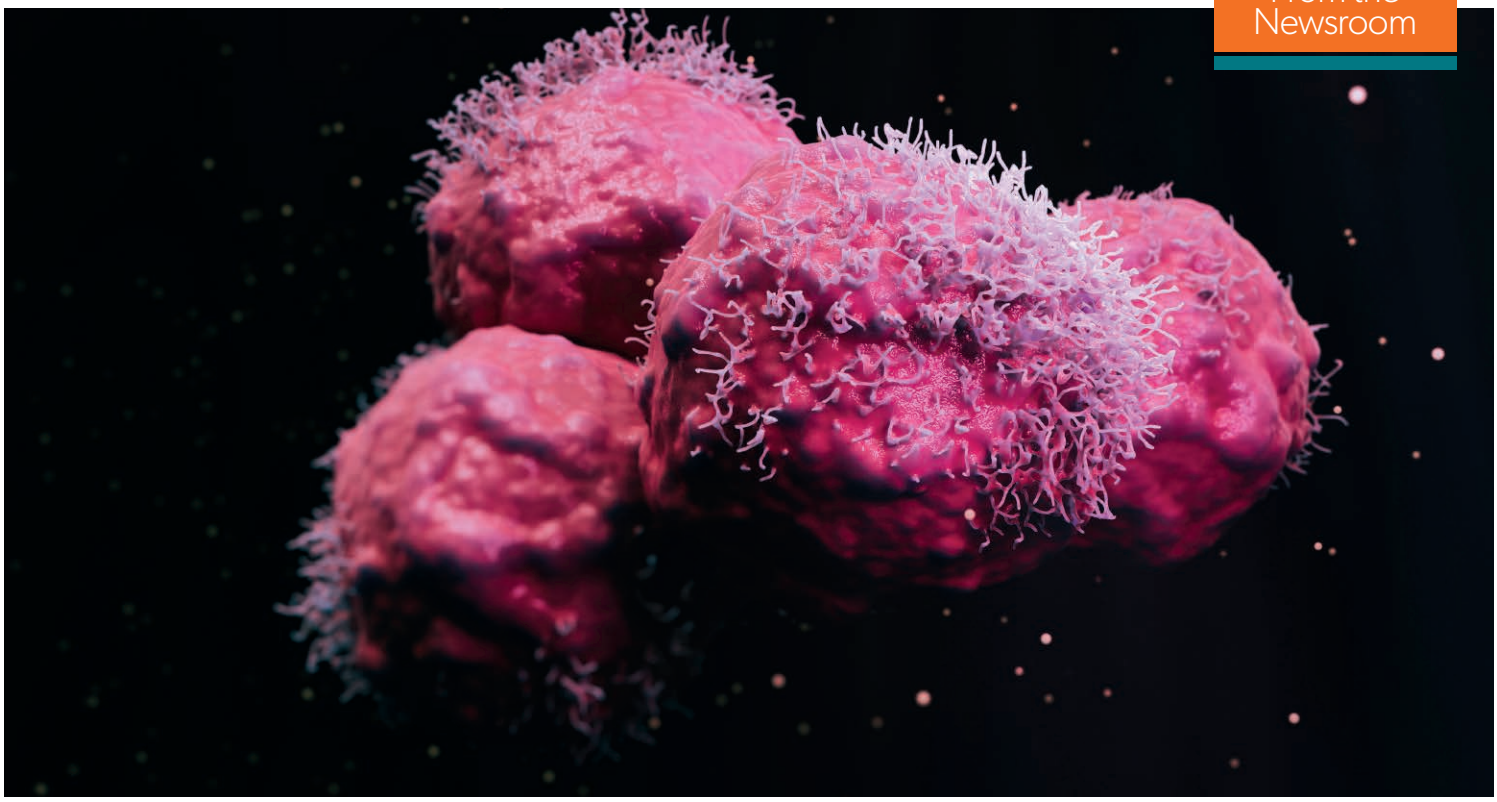


Survey Reveals Changing Genetic Testing Patterns, Persistent Disparities in Precision Oncology

Precision Oncology News' 2022 survey showed doctors are increasingly offering molecular testing to earlier-stage patients, but institutions still need to do better to ensure patients have equitable access.

By Turna Ray

The growing list of biomarker-informed treatments for patients with earlier-stage disease is spurring more doctors to molecularly profile stage I and II tumors, a survey of US-based precision oncology programs suggests.

However, just because more personalized treatments and molecular tests are available on the market doesn't mean patients have equitable access to them. As in past years, *Precision Oncology News'* 2022 survey showed that healthcare institutions and cancer centers need to do better in terms of identifying and mitigating access gaps.

In this fourth annual survey, *Precision Oncology News* queried experts knowledgeable of precision oncology activities at 20 institutions around the country to understand the investments they're making to improve patients' access to molecular testing and personalized treatment options. Between September and December 2022, *Precision Oncology News* reached out to individuals in leadership positions at small and large cancer centers, hospitals, and community practices around the country. Most of the respondents were oncologists, physician-scientists, and medical

directors, although program administrators and liaisons, as well as pharmacists with expertise in precision medicine also participated.

The 20 responses, however, ultimately came from experts at large, regional healthcare systems, academic institutions, and National Cancer Institute-designated comprehensive cancer centers. Specifically, 40 percent of respondents worked at a cancer center within a nonprofit or for-profit healthcare system; 40 percent worked at an academic cancer center; and 20 percent were at an NCI-designated cancer center. These types of facilities are more likely to have made early and significant investments in precision oncology. Most cancer patients in the US, however, are treated at community practices with limited resources to implement precision oncology programs, and as such, access gaps are likely worse than what is captured in this survey.

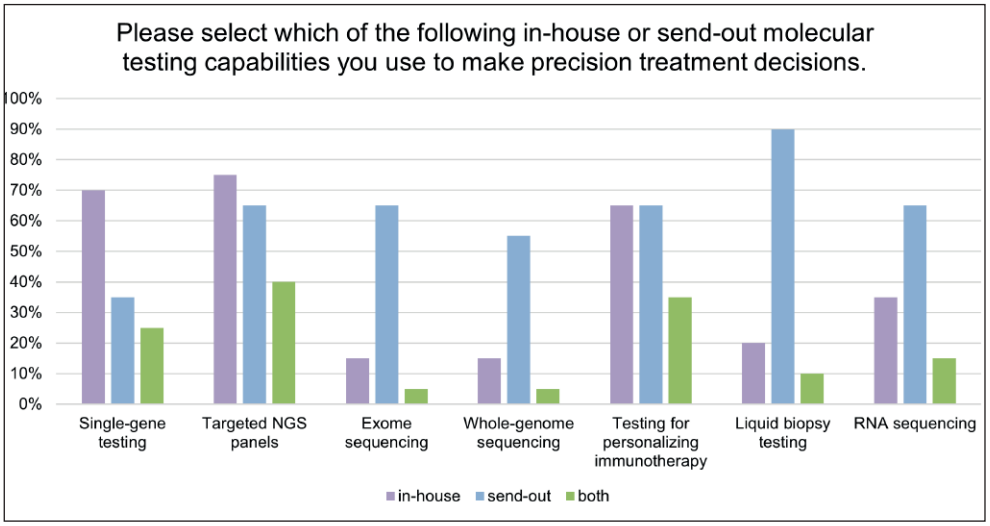
When it comes to targeted NGS panels and testing for immunotherapy biomarkers such as PD-L1 expression, microsatellite instability, and tumor mutational burden, oncologists at these institutions seem to be using in-house tests and ordering from commercial labs at similar rates

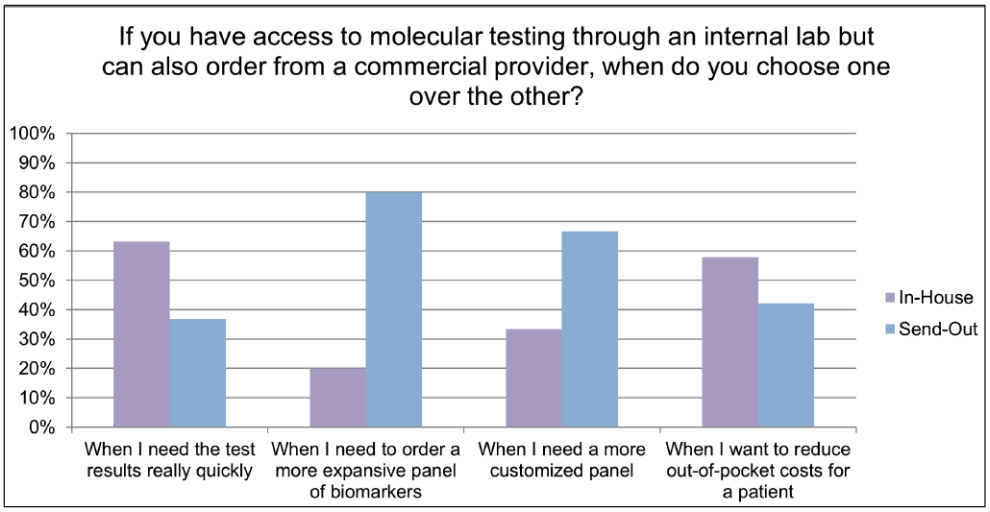
In line with the survey findings in prior years, the 2022 survey showed that providers within precision oncology programs have a mix of in-house and send-out molecular tests available to them. In 2021, the most common in-house testing capabilities were single-gene tests (50 percent), tests for personalizing immunotherapy (45 percent), and targeted NGS panels (35 percent). These same tests remain the most common in-house offerings in 2022, but even more cancer centers, 65 percent or more have invested in internally setting up such tests.

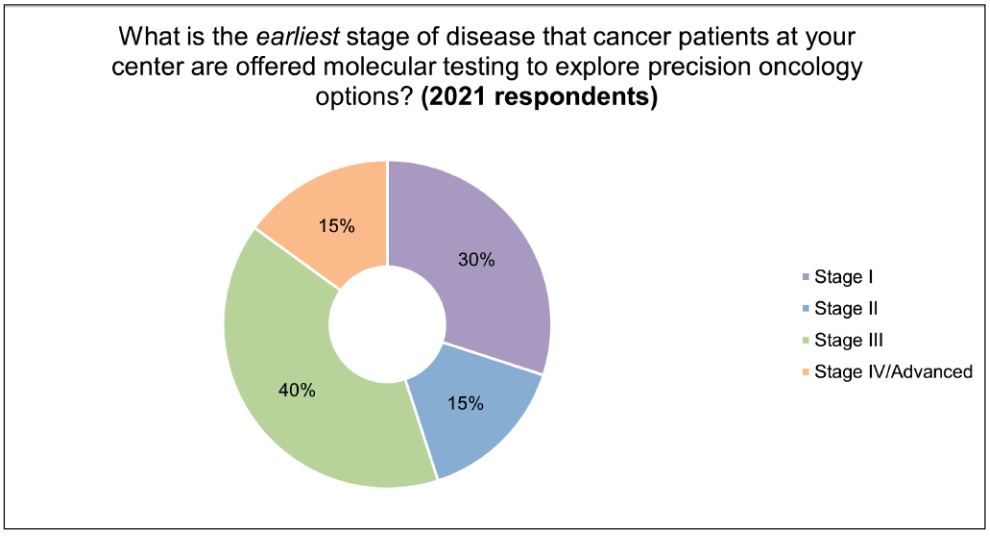
Liquid biopsy testing is most likely to be a send-out test, as noted by 90 percent of those surveyed, followed by RNA, exome, and whole-genome sequencing. When asked which commercial labs doctors order molecular testing from, Tempus was cited by 11 respondents, Foundation Medicine got 10 mentions, Caris got nine, and Guardant Health got seven. In 2021, Foundation Medicine was the most popular commercial lab among surveyed respondents.

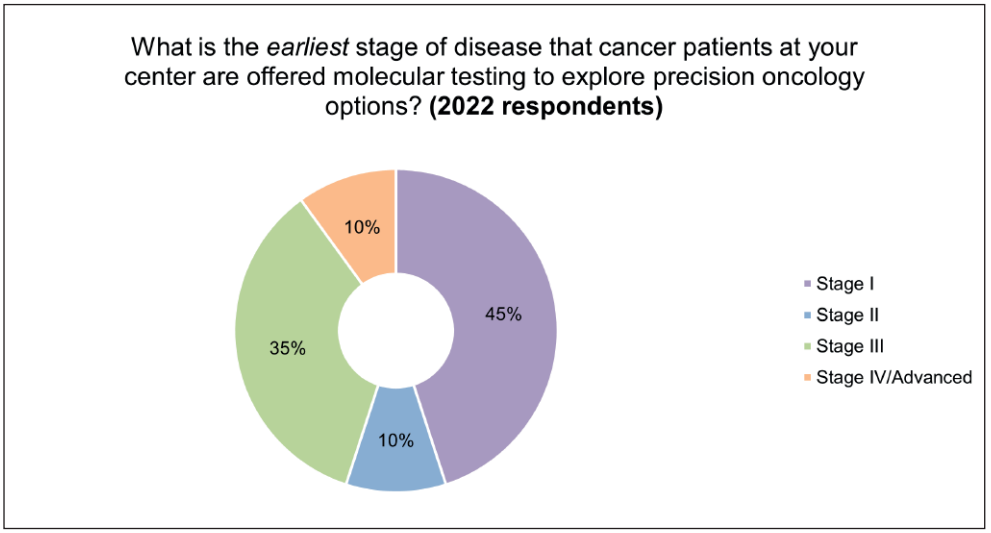
When it comes to targeted NGS panels and testing for immunotherapy biomarkers such as PD-L1 expression, microsatellite instability, and tumor mutational burden, oncologists at these institutions seem to be using in-house tests and ordering from commercial labs at similar rates. When asked what factors drive whether a doctor uses an in-house versus send-out test, the top reasons for going with internally offered tests included quick turnaround of results and the chance to lower out-of-pocket costs for patients. When doctors wanted to test patients on a more expansive or customized set of biomarkers, they looked to commercial offerings.

Even though most precision oncology drugs are approved for advanced cancer patients, the



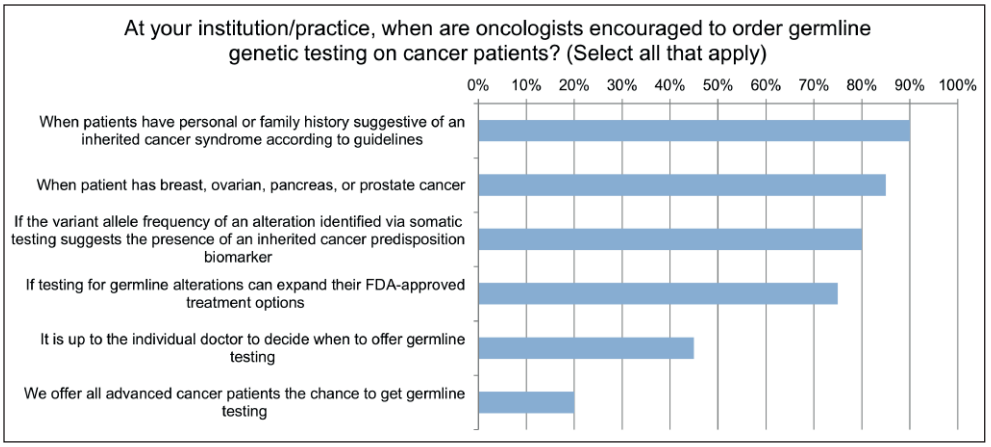


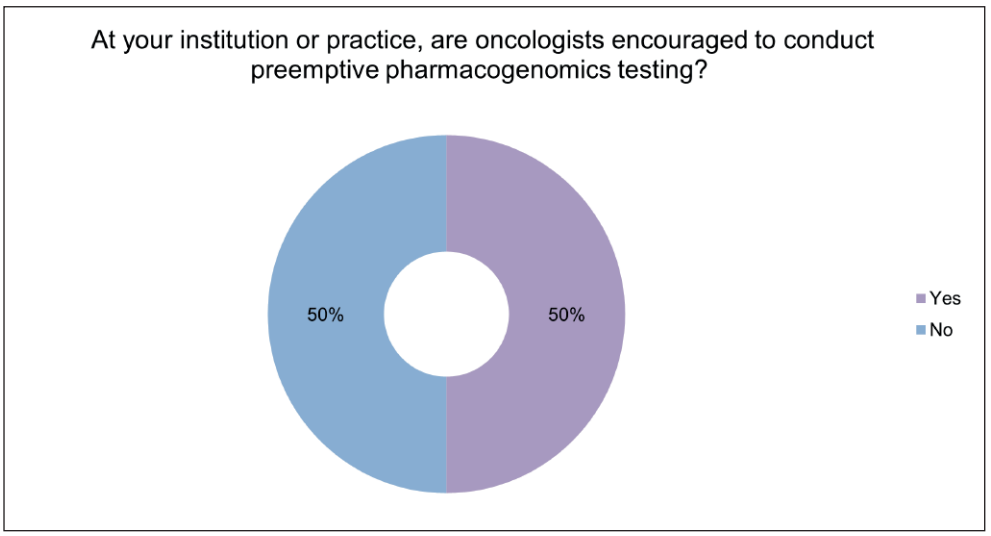




US Food and Drug Administration in recent years has approved precision therapies for earlier-stage disease. All in the last two years, Genentech's immunotherapy Tecentriq (atezolizumab) has become available as an adjuvant treatment for PD-L1-expressing stage II to stage IIIa non-small cell lung cancer; AstraZeneca's EGFR inhibitor Tagrisso (osimertinib) has become an adjuvant treatment option for EGFR-mutated stage Ib to stage III NSCLC; and AstraZeneca/Merck's PARP inhibitor Lynparza (olaparib) can be given as adjuvant treatment to early-stage breast cancer patients with germline BRCA1/2 mutations.

The availability of these precision medicine options is spurring oncologists to test more early-stage patients to gauge their eligibility.





2022 is the first year that a greater proportion of respondents said their institutions were offering molecular testing to patients with stage I/II cancers versus more advanced cancers – 55 percent and 45 percent, respectively. In 2021, by comparison, 45 percent said their institutions were testing stage I and stage II cancer patients, and 55 percent said they mostly tested patients with more advanced tumors.

Much like in 2021, there appears to be strong awareness among surveyed cancer centers in 2022 about the need to perform germline genetic testing in certain cancer patients. Between 80 percent and 90 percent of respondents said that their institutions encourage germline testing for patients with a personal or family history of inherited cancer syndromes; when patients have tumor types that are associated with high-penetrance germline variants, such as in BRCA1/2; and if the variant allele frequency of an alteration identified by tumor profiling suggests the presence of a cancer-linked germline variant.

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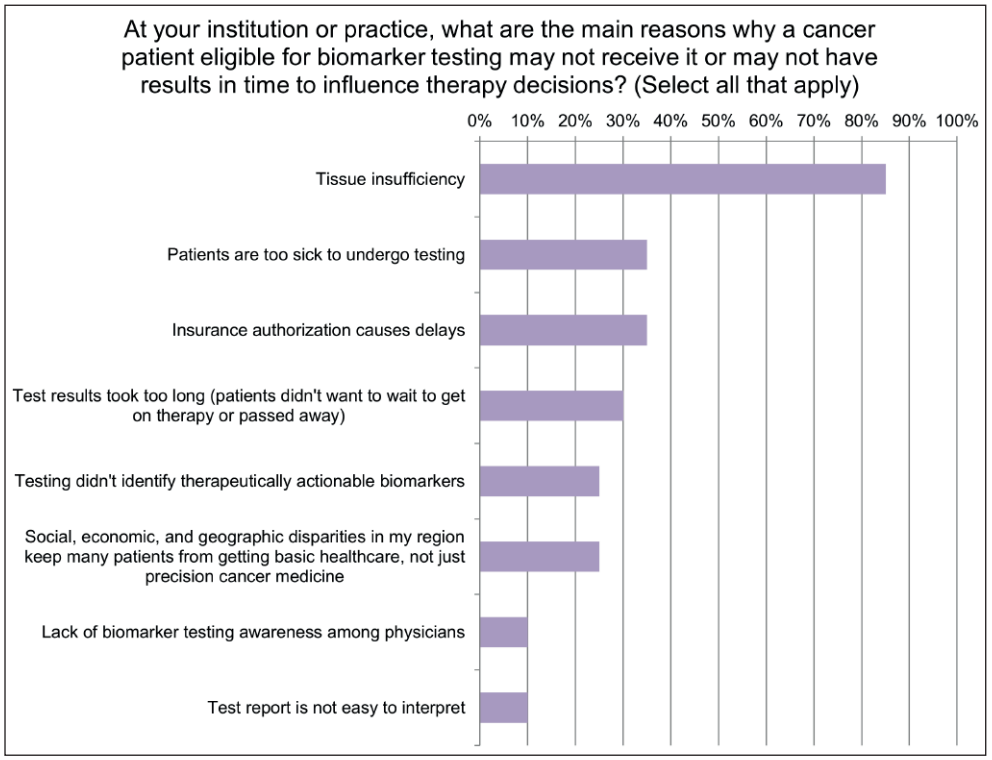
Two respondents wrote in that a genetic counselor and the patient's primary doctor or a geneticist help decide when germline testing is appropriate. Meanwhile, four respondents, 20 percent, said all advanced cancer patients at their institutions are offered the chance for germline testing. This may be in response to studies, some conducted by molecular testing labs and others by academic researchers, showing that family history and current testing guidelines may not be capturing all patients at heightened genetic risk for cancer.

In 2022, there was more discussion among precision oncology experts about the need to test cancer patients for pharmacogenomics variants that impact their ability to respond to commonly prescribed drugs or place them at risk for life-threatening toxicities. At the American Society of Clinical Oncology's annual meeting last year, for example, experts debated whether patients considering chemotherapies 5-FU (fluorouracil) and Xeloda (capecitabine) should be tested for DPYD variants that increase their chances of severe, sometimes deadly, adverse events.



Even though the FDA and the National Comprehensive Cancer Network don't recommend DPYD testing all patients before prescribing Xeloda and 5-FU, some leading US cancer centers are investing in setting up pre-treatment testing programs anyway. Still, DPYD or broader PGx testing is not routinely offered at most cancer centers in the US, including at some leading institutions with precision oncology programs where patients can readily access other types of molecular tests for personalizing treatment.

As such, with 50 percent of respondents to the 2022 survey indicating their institutions encourage doctors to conduct pharmacogenomics testing, the *Precision Oncology News* survey paints a rosier picture of test adoption, probably because most respondents work at large health systems or at academic or NCI-designated comprehensive cancer centers more likely to have made this type of investment. Within institutions that do offer PGx testing to cancer patients, respondents said oncologists are most likely to test for DPYD variants followed by UGT1A1 variants, which can help identify patients at risk for adverse events from irinotecan, a chemotherapy often prescribed for colorectal cancer, and other drugs.

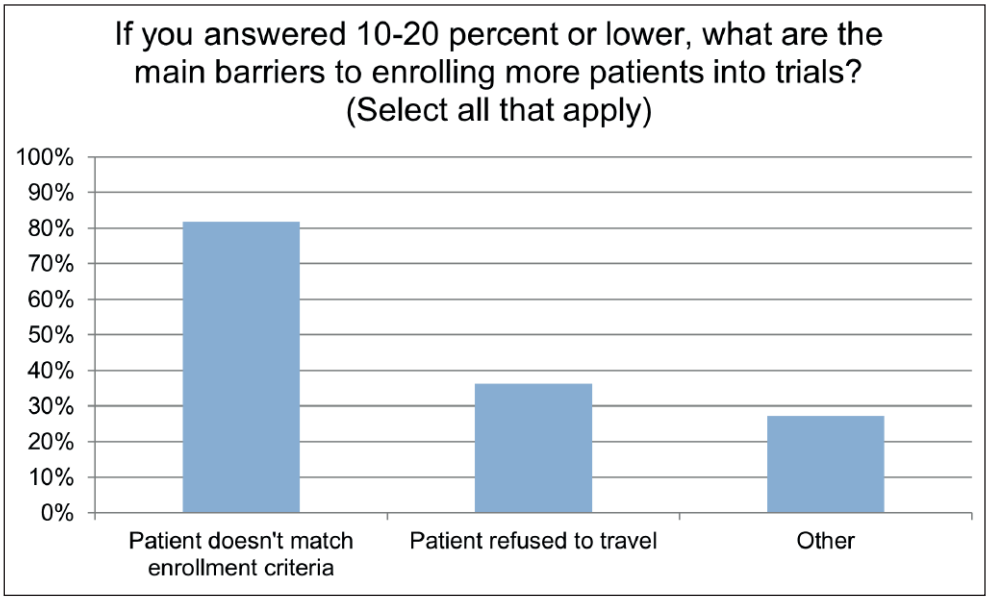
While the market availability of more precision oncology drugs and genetic tests are signs that patients have more options, that doesn't mean patients can necessarily access those options. For example, patients with NSCLC have perhaps the most FDA-approved precision medicine treatment opportunities based on specific tumor markers. According to an analysis published last year by the Personalized Medicine Coalition and health technology firm Diaceutics, however, for every 1,000 patients with NSCLC in Diaceutics' data repository, nearly half did not receive precision therapy due to suboptimal biomarker testing, and 30 percent of those who did manage to get tested didn't end up on the appropriate targeted therapy.

Precision Oncology News' survey tried to identify the reasons why patients aren't getting tests and treatments. Tissue insufficiency (85 percent), patients being too sick (35 percent), and insurance barriers (35 percent) were the top three reasons respondents cited for why a patient may not receive biomarker testing or may not have results in time to inform treatment decisions. Five respondents said that social, economic, and geographic disparities in their region keep many patients from getting basic healthcare, not just precision medicine, and another five said that tests also fail to identify actionable biomarkers in many patients.

All surveyed institutions had ongoing clinical trials that offer eligible patients the chance to receive an investigational precision therapy, and yet, 12 respondents said that 20 percent or fewer patients actually enroll in a trial based on an actionable biomarker. Eight respondents estimated that between 20 percent and 30 percent of patients get on a precision oncology drug trial.

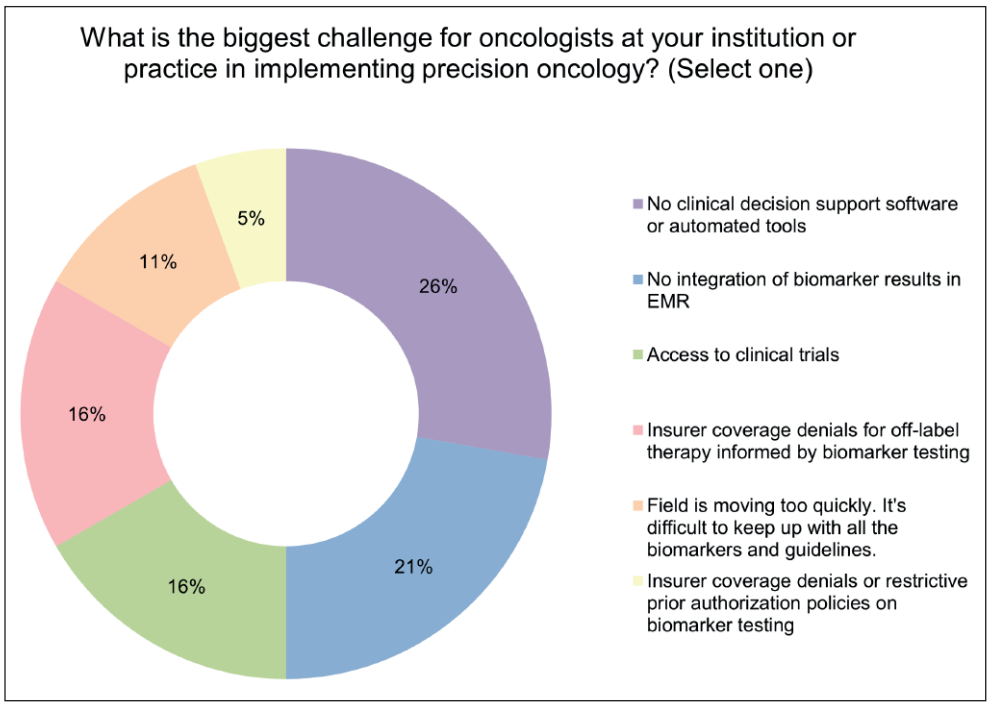
At the institutions where only 20 percent or fewer patients got on a trial, respondents most frequently blamed trial enrollment criteria followed by the fact that patients are often burdened with the need to travel to faraway sites. Others wrote in that institutions don't always have enough trials open for patients and that patients may not have the rare biomarkers that are so often of research interest within precision oncology drug trials.

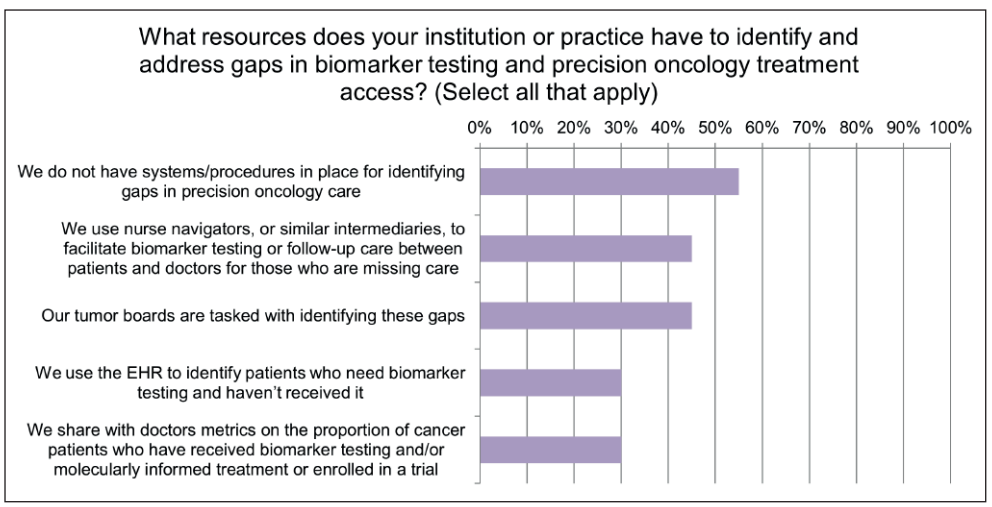
When respondents were asked to flag the biggest hindrance to precision oncology implementation, five out of 19 respondents cited the lack of clinical decision support software or other automated tools that can help doctors make treatment decisions based on the most up-to-date guidelines and evidence. Four respondents said the inability to easily access patients' biomarker results in electronic medical records was the biggest challenge. One respondent wrote in that

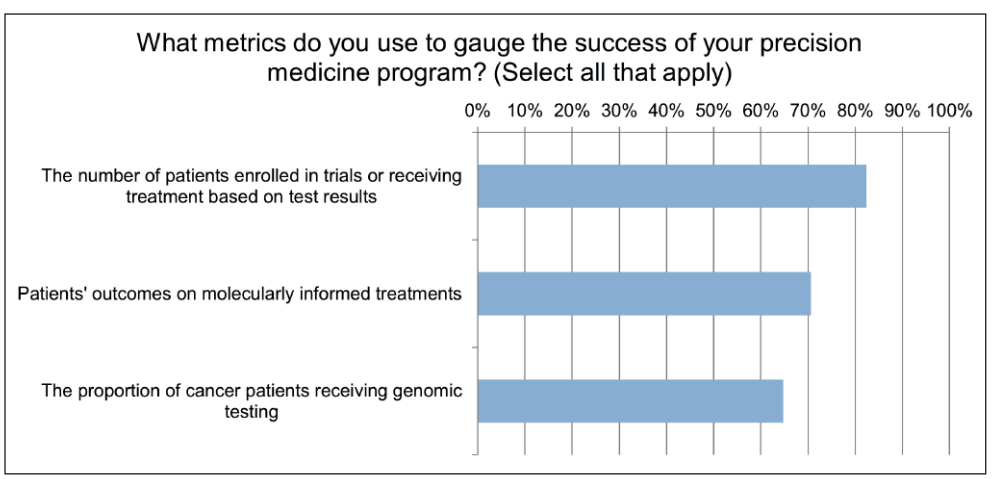


institutional implementation of Epic Systems' genomics module has helped ease this barrier.

Indeed, a number of molecular testing labs last year partnered with Epic to facilitate test ordering and results reporting directly through the EMR. However, critics say that improvements are too incremental, and EMR platforms still cannot pull in all the types of patient data, genomics and beyond, needed to truly deliver precision care.







Three respondents said limited access to precision oncology trials and another three said insurers' unwillingness to cover biomarker-informed off-label treatments were the biggest barriers to practice. Only two respondents flagged the rapid pace of advancements in the precision oncology space as the main hurdle, which was the most cited barrier in 2021, while in prior years, insurance difficulties had been mentioned most.

Even though multiple studies have shown that a significant proportion of cancer patients are not being tested for guidelines-backed biomarkers that are critical for deciding treatment, a notable proportion in this survey, more than 50 percent, acknowledged that their institutions don't have any systems or procedures in place for identifying and addressing gaps in patients' ability to access precision care.

Somewhat encouragingly, around 45 percent said efforts were underway at their institutions to mitigate disparities with the help of nurse navigators or tumor boards. To a lesser extent, some said that their cancer centers are tracking eligible patients through the EMR and sharing data with providers on the proportion of patients that received biomarker testing or precision treatment in an attempt to improve access.

Lastly, when asked what metrics institutions used to gauge the success of their precision medicine efforts, the results were similar to 2021, in that the number of patients enrolled in a trial or receiving treatment was the most oft-cited metric, followed by how patients actually fared on molecularly informed treatments, and the proportion of patients getting genomic testing. Still, one person said he or she didn't know what metrics were used to gauge success, while another said there was no centralized mechanisms funded for tracking the benefits of the precision oncology program. Two respondents wrote in that their institutions were looking at the number of cases discussed by molecular tumor boards and how MTB-recommended treatments are impacting patients' outcomes and treatment costs. PMQ

Turna Ray

Turna has been covering the personalized medicine and molecular diagnostics industries for *GenomeWeb* since 2006. She closely tracks the evolving regulatory, reimbursement, and business environment for precision medicine products. In 2019, she became managing editor of *Precision Oncology News*, and now guides coverage for the newly launched *Precision Medicine Online*.