



# BiomarkerLIVE



## Talking with Your Patients About Biomarker Testing in Cancer Care

**Biomarker testing can improve care for many patients who have certain types of cancer or are at risk for cancer.**

### **Results from biomarker testing can help providers:**

- Detect, stage, or classify cancer
- Assess how quickly the cancer may grow or spread
- Determine what targeted therapies are more or less likely to work
- Assess a patient's risk of cancer and cancer recurrence

### **Results from biomarker testing can help patients:**

- Obtain information about their cancer risk
- Understand their specific type or subtype of cancer
- Make informed decisions about cancer treatment and prevention
- Feel more comfortable with the quality of care that they are receiving

Although the benefits of biomarker testing have been shown, many patients do not end up receiving the recommended tests. Low testing rates may be related to their complex and confusing terminology. This can cause patients to misunderstand the importance of biomarker testing during discussions with providers.

This fact sheet provides clear, straightforward information to assist talking with patients about biomarker testing and its role in their care, including:

- Biomarker basics
- Types of cancer biomarker testing
- How biomarker testing is used in cancer care
- Why biomarker testing is used
- Best practices in biomarker testing
- Questions patients may want to discuss
- Patient resources



# How Providers Can Relay Biomarker Testing Information to Patients

## Biomarker Basics

A biomarker is any characteristic of the body that can be measured to assess an individual's health. Examples of common biomarkers include body temperature, which can indicate infection when elevated, and blood pressure, which can indicate heart disease when elevated. Biomarkers for cancer include DNA, RNA, proteins, and other molecules. These molecules may be over-expressed, under-expressed, or have other changes known as variants or mutations. These changes in molecules can directly drive cancer growth, and they can affect the ability of the cancer to respond to treatment.

In cancer care, biomarkers are often referred to by a three- or four-letter abbreviation. Examples include HER2 in breast cancer or EGFR in lung cancer. A positive test (classified as HER2+ or EGFR+) means the cancer's genes have that mutation.

## Types of Cancer Biomarker Testing

There are many types of tests for cancer that look for specific changes in molecules or their expression. Different types of samples are used, depending on the test (See Figure 1).

## ● ● ● ● ● FIGURE 2: Role of Genetic Counselors In Cancer Care

**Genetic counselors specialize in medical genetics. They can help patients:**

- Understand how their personal medical history and their family's cancer history may affect their risk for cancer
- Understand the benefits, risks, and limitations of biomarker testing
- Develop a plan for cancer prevention, risk reduction, or treatment
- Cope with their emotions related to the testing results
- Decide how they want to share testing results with their family
- Find answers to their questions about insurance coverage, cost, and other issues related to cancer care

Doctors can provide patients with a referral to a genetic counselor who specializes in cancer genetics. Patients can also search online to find one. Many genetic counselors offer both in-person and telehealth consultation.

## Cancer biomarker testing includes:

- **Tissue biopsy.** Upon a patient's cancer diagnosis, doctors order a biopsy of the tumor tissue, which is put through a series of tests to determine the nature of the cancer. These tests can include:
  - Immunohistochemistry (IHC): reveals whether the cancer cells have certain hormone receptors (such as HER2) on their surface.
  - Fluorescent in situ hybridization (FISH): can indicate genetic abnormalities associated with certain cancers.
  - Flow cytometry: reveals information about the presence and extent of cancer cells.
- **Genetic tests for inherited mutations (germline genetic testing)** can reveal inherited changes (mutations) in genes that may increase a person's risk of developing certain types of cancer. Patients may benefit from discussing their genetic testing results with a genetic counselor (See Figure 2).
- **Testing cancer cells for mutations** can help determine what treatment is most likely to work for a patient's specific subtype of cancer. The testing may look for germline changes (inherited mutations) and somatic changes (non-inherited mutations.) This type of testing can also be called:
  - Molecular testing or profiling
  - Tumor testing or profiling
  - Mutation testing
  - Somatic testing
  - Genomic testing

## ● ● ● ● ● FIGURE 1: Type of Samples Used For Biomarker Testing

**Different cancer biomarker tests require different types of samples.**

Tests may need one or more of the following samples:

- When a solid tumor is present, a small tissue sample taken during surgery or a biopsy
- A body fluid sample, such as saliva or urine
- A blood sample

A laboratory analyzes the molecules in each sample and produces a report. While local laboratories can complete some tests, other tests require a specialized laboratory. Depending on the type of test, results can arrive in a few days, or take up to two to four weeks.

## Why Biomarker Testing is Used

There are multiple reasons for clinicians to order biomarker testing for their patients:

- For people with a family history of cancer, testing may be ordered to determine their risk of inherited cancer.
- If a person exhibits symptoms that may suggest a cancer diagnosis, testing can determine cancer subtype.
- For people recently diagnosed with cancer, testing can guide treatment recommendations. Biomarker testing can be ordered immediately after diagnosis and/or after treatment to determine the extent/nature of a cancer.
- Clinicians may order repeated biomarker testing to determine if a treatment is effective or if the cancer has returned after treatment.

## Results Can Guide Cancer Treatment Decisions

Not all cancers are the same, even if they go by the same name. For example, there are several different subtypes of lung cancer and breast cancer. Some treatments work for some subtypes, but not for others. Biomarker testing results can help indicate which cancer treatments are appropriate for a patient's specific subtype of cancer.

Biomarker test results can also indicate whether a patient is eligible

to participate in a clinical trial. After treatment begins, biomarker testing can reveal whether a treatment is stopping or slowing the cancer's growth. Biomarker testing can also be used to determine if an individual is at an increased risk of developing cancer in the future, and it can provide information about the severity of a cancer and how fast or slow it is growing.

## Best Practices in Biomarker Testing

Since not all types of cancer are appropriate for the variety of biomarker tests currently available, physicians should talk to their patients about which tests are appropriate for their specific cancers. Current NCCN practice guidelines can provide instruction on how to approach this patient interaction. While some biomarker tests are widely known and ordered automatically, new, or lesser-known tests may be appropriate for specific types of cancer.

Physicians should stay current on best-practice recommendations for genetic testing for germline mutations and for biomarker testing for somatic mutations to ensure patients receive all recommended biomarker testing. Guidelines can be found at [nccn.org/guidelines](https://www.nccn.org/guidelines).

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## TAKE ACTION: Patient-Provider Discussions

Use ACCC's **Conversation Guide: Biomarker Testing and its Role in Cancer Care** to help guide discussion with your

patients on frequently asked questions related to biomarker testing. Access this tool at [acc-cancer.org/biomarker-guide](https://acc-cancer.org/biomarker-guide).



Association of Community Cancer Centers

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In partnership with Cancer Support Community, Fight Colorectal Cancer, Living Beyond Breast Cancer, LUNGevity, and Clarity. This project is supported by AbbVie, AstraZeneca, Lilly Oncology, and Merck & Co., Inc.

A publication from the ACCC education program, "BiomarkerLIVE." Learn more at [acc-cancer.org/biomarkerlive](https://acc-cancer.org/biomarkerlive). The Association of Community Cancer Centers (ACCC) is the leading education and advocacy organization for the cancer care community. For more information, visit [acc-cancer.org](https://acc-cancer.org).