

# What to Know

## ASCO's Guideline on Tumor Markers for Breast Cancer

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### KEY MESSAGES

- A tumor marker is a substance produced by the tumor or a person's body in response to cancer.
- Tumor markers can help your doctor plan and monitor treatment.
- This patient guide recommends the use of different tumor markers for different types of breast cancer; talk with your doctor about which tests are most appropriate for you.

To help doctors give their patients the best possible care, the American Society of Clinical Oncology (ASCO) asks its medical experts to develop recommendations for specific areas of cancer care. ASCO developed a clinical practice guideline about tumor markers for breast cancer. This guide for patients is based on ASCO's recommendations.

### BACKGROUND

A tumor marker is a substance found in a person's blood, urine, or the tumor itself. It is produced by the tumor or the body in response to cancer. Your doctor may suggest tumor marker tests at various stages in the diagnosis and treatment of cancer. When used with other medical tests, a tumor marker test can provide helpful information about the cancer and its treatment.

Tumor markers for breast cancer may be used for one or more of the following reasons:

- To help plan treatment with regard to one of the following conditions:
  - To find out whether a patient has a cancer with a favorable prognosis (the behavior of the cancer and the patient's chance of recovery) and may not need additional treatment
  - To predict whether a specific treatment will successfully treat a patient
- To check how a patient is doing over time
- To learn the risk of developing cancer (not addressed in this patient guide)

- To find cancer before there are any signs or symptoms (not addressed in this patient guide)

The following breast cancer tumor markers are discussed in this patient guide:

### **Estrogen receptor (ER) and progesterone receptor (PR).**

Breast cancer cells with ER and/or PR depend on estrogen and/or progesterone to grow. Testing for ER and PR is done to find out if a cancer is likely to be successfully treated with hormone therapy, such as tamoxifen (Nolvadex).

### **Human epidermal growth factor receptor 2 (HER2).**

This protein is present in 20% to 25% of breast cancers in large amounts. Anti-HER2 treatments block HER2 to stop the growth of cancer cells. Testing for HER2 helps doctors know if a cancer can be treated with anti-HER2 treatments, such as trastuzumab (Herceptin), and in some cases, may suggest whether additional treatment with chemotherapy may be helpful.

### **Cancer antigen 15-3 (CA 15-3), cancer antigen 27.29 (CA 27.29), and carcinoembryonic antigen (CEA).**

These tumor markers are found in 50% to 90% of patients with metastatic breast cancer (cancer that has spread outside the breast). However, high levels may also be a sign of another condition that is not cancer. Some doctors monitor these tumor markers to find an early recurrence (the return of cancer after treatment) in patients who do not show any signs of cancer after surgery, radiation therapy, and/or chemotherapy. A doctor may also use this test to learn whether cancer treatment is working.

### **Urokinase plasminogen activator (uPA) and plasminogen activator inhibitor (PAI-1).**

Higher-than-normal levels of these tumor markers in the cancer tissue may mean that the cancer is more aggressive (faster growing). Accurate tests of uPA and PAI-1 require a specific way of saving and storing the tissue, so these tests may not be as common as the other tumor marker tests mentioned in this guide.

These tumor markers may be used to guide the use of chemotherapy after surgery for patients with node-negative breast cancer (meaning there is no cancer found in the lymph nodes).

### **Oncotype DX.**

This is a test that measures multiple genes at once to estimate the risk of breast cancer recurrence for patients with early-stage, ER-positive, node-negative breast cancer. Patients with a low Recurrence Score may only need to be treated with hormone therapy and can avoid chemotherapy.

## **RECOMMENDATIONS**

ASCO recommendations that the following tumor markers may be used in the following situations:

### **For patients with newly diagnosed ductal carcinoma in situ (DCIS):**

- DCIS means that cancer has not spread outside of the ducts in the breast. It is also called noninvasive breast cancer. No tumor marker tests for DCIS are recommended at this time.

### **For patients with newly diagnosed invasive breast cancer:**

- ER and PR tests, to help predict response to hormone therapy after surgery
- HER2 test, to help predict response to trastuzumab and other anti-HER2 treatments and some types of chemotherapy

Once these tests are done, the cancer is classified as ER-positive (if the tumor has estrogen receptors) or ER-negative (if the tumor does NOT have estrogen receptors); PR-positive (if the tumor has progesterone receptors) or PR-negative (if the tumor does NOT have progesterone receptors); and HER2-positive (if the tumor does have HER2) or HER2-negative (if the tumor does NOT have HER2). Learn more about ASCO's recommendations for HER2 testing at [www.cancer.net/whattoknow](http://www.cancer.net/whattoknow).

### For patients with node-negative breast cancer:

- uPA and PAI-1 tests, if available, to estimate the prognosis. Patients with tumors that do not have uPA and PAI-1 have a very good prognosis and may not need chemotherapy.

### For patients with node-negative breast cancer that is ER-positive and/or PR-positive:

- Oncotype DX test, to identify patients who may be successfully treated with tamoxifen alone and may not need chemotherapy

### For patients with metastatic breast cancer:

- ER and PR tests, to help predict response to hormone therapy
- HER2 test, to help predict response to trastuzumab and other anti-HER2 treatments
- CA 15-3 and CA 27.29, for monitoring treatment; these should be used along with the patient's health history, a physical examination, and diagnostic imaging tests, such as an x-ray, computed

tomography (CT) scan, and/or magnetic resonance imaging (MRI).

- CEA, for monitoring treatment; this test should be used along with the patient's health history, a physical examination, and diagnostic imaging tests.

### For patients with recurrent breast cancer:

- HER2 test, to help predict response to trastuzumab and other anti-HER2 treatments and guide the use of specific chemotherapy

## WHAT THIS MEANS FOR PATIENTS

Tumor marker tests may help plan and monitor treatment and guide prognosis. However, not every tumor marker is appropriate for every stage of breast cancer. The tumor markers that ASCO recommends have been shown in clinical trials to be useful for predicting response to treatment and/or finding the best treatment for people with breast cancer. Use this guide to discuss tumor marker tests and results with your doctor.

## QUESTIONS TO ASK THE DOCTOR

To learn more about tumor markers for breast cancer, consider asking your doctor the following questions:

- What tumor marker tests do you recommend? Which ones have already been performed?
- How are these tests performed?
- How often do I need these tests?
- Are the tests done in a laboratory accredited by the College of American Pathologists (CAP)?
- What are the results of these tests, and how will the results affect my treatment?
- What health conditions or medications may interfere with these tests?
- What clinical trials are open to me?
- Where can I find more information?

## HELPFUL LINKS

Read the entire clinical practice guideline at [www.asco.org/guidelines/breasttm](http://www.asco.org/guidelines/breasttm).

Cancer.Net Guide to Breast Cancer  
[www.cancer.net/breast](http://www.cancer.net/breast)

What to Know: ASCO's Guidelines on Follow-Up Care for Breast Cancer  
[www.cancer.net/whattoknow](http://www.cancer.net/whattoknow)

Understanding Tumor Markers  
[www.cancer.net/features](http://www.cancer.net/features)

## ABOUT ASCO'S GUIDELINES

To help doctors give their patients the best possible care, ASCO asks its medical experts to develop evidence-based recommendations for specific areas of cancer care, called clinical practice guidelines. Due to

the rapid flow of scientific information in oncology, new evidence may have emerged since the time a guideline or assessment was submitted for publication. As a result, guidelines and guideline summaries, like this one, may not reflect the most recent evidence. Because the treatment options for every patient are different, guidelines are voluntary and are not meant to replace your physician's independent judgment. The decisions you and your doctor make will be based on your individual circumstances. These recommendations may not apply in the context of clinical trials.

The information in this guide is not intended as medical or legal advice, or as a substitute for consultation with a physician or other licensed health care provider. Patients with health care-related questions should call or see their physician or other health care provider promptly, and should not disregard professional medical advice, or delay seeking it, because of information encountered in this guide. The mention of any product, service, or treatment in this guide should not be construed as an ASCO endorsement. ASCO is not responsible for any injury or damage to persons or property arising out of or related to any use of this patient guide, or to any errors or omissions.

## RESOURCES

Good cancer care starts with good cancer information. Well-informed patients are their own best advocates, and invaluable partners for physicians. ASCO's patient website, Cancer.Net, brings the expertise and resources of the world's cancer physicians to people living with cancer and those who care for and care about them. ASCO is composed of more than 28,000 oncologists globally who are the leaders in advancing cancer care. All the information and content on Cancer.Net was developed and approved by the cancer doctors who are members of ASCO, making Cancer.Net the most up-to-date and trusted resource for cancer information on the Internet. Cancer.Net is supported by The ASCO Cancer Foundation, which provides funding for cutting-edge cancer research, professional education, and patient and family support. People in search of cancer information can feel secure knowing that the programs supported by The ASCO Cancer Foundation provide the most thorough, accurate, and up-to-date cancer information found anywhere.

Visit Cancer.Net to find guides on more than 120 types of cancer and cancer-related syndromes, clinical trials information, coping resources, information on managing side effects, medical illustrations, cancer information in Spanish, podcasts, videos, the latest cancer news, and much more. For more information about ASCO's patient information resources, call toll free 888-651-3038.



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[www.asco.org](http://www.asco.org) • [www.cancer.net](http://www.cancer.net) • [www.jco.org](http://www.jco.org) • [www.jopasco.org](http://www.jopasco.org) • [www.ascocancerfoundation.org](http://www.ascocancerfoundation.org)

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