



Understanding Lung Cancer in Women

**A Patient's Guide to Biomarkers,
Precision Medicine, and Clinical Trials**

Created in collaboration with **Tigerlily Foundation** and **Bristol Myers Squibb**



What is Lung Cancer?

Lung cancer begins when abnormal cells in the lungs grow uncontrollably and form tumors.

Over time, these cells may affect breathing, spread to nearby tissues, or travel to other parts of the body.

Lung cancer is one of the most common cancers worldwide and can affect people of all ages, backgrounds, and lifestyles. Although smoking remains the leading risk factor, lung cancer can also occur in people who have never smoked. Factors such as environmental exposures, inherited genetic changes, and other biological influences may also contribute to risk.

There are two main types of lung cancer:

Non-Small Cell Lung Cancer (NSCLC)

Small Cell Lung Cancer (SCLC)

Researchers continue studying how hormones, genetics, family history, environmental exposures, air quality, secondhand smoke, occupational exposures, and biomarker patterns may affect lung cancer risk and treatment response in women.

Having one or more risk factors does not mean a person will develop lung cancer, and some people diagnosed with lung cancer have no known risk factors. Researchers continue to learn more about why lung cancer develops in different individuals.

Lung Cancer in Women

Lung cancer does not always look the same in women as it does in men.

Women may be diagnosed:

- At younger ages
- Without a smoking history
- With different genetic mutations or biomarkers
- With symptoms that may be mistaken for other conditions
- With a family history of lung cancer or other cancers, in some cases

Some symptoms may overlap with asthma, allergies, stress, menopause, or common respiratory illnesses, which can sometimes delay diagnosis.

Understanding your symptoms, knowing your personal and family health history, and advocating for timely evaluation can be important parts of your care.

Common Signs and Symptoms

Symptoms vary depending on the type and stage of lung cancer. Some people experience only a few symptoms, while others may have none in the early stages of the disease.

Common Signs and Symptoms

Persistent cough

Shortness of breath

Chest pain

Wheezing

Hoarseness

Unexplained weight loss

Recurring respiratory infections

Shoulder or back pain

Coughing up blood

Fatigue

Many of these symptoms can also be caused by conditions other than lung cancer. However, symptoms that are persistent, worsening, or unusual should not be ignored and should be discussed with a healthcare provider. Early evaluation can help identify the cause and determine whether additional testing is needed.

How Lung Cancer is Diagnosed

If lung cancer is suspected, your healthcare provider may recommend a series of tests to determine whether cancer is present, identify the type of lung cancer, and understand how advanced it is. The results also help guide personalized treatment decisions.

Diagnosing lung cancer may involve:

- Imaging scans (such as chest X-rays, CT scans, or PET scans)
- Biopsy to collect a sample for testing (tissue biopsy or blood)
- Blood tests
- Pathology testing
- Biomarker testing
- Molecular profiling or next-generation sequencing (NGS)
- Pulmonary (lung) function tests, when appropriate

Your care team may include:

- Pulmonologists
- Medical oncologists
- Thoracic surgeons
- Radiologists
- Pathologists
- Nurse navigators



Not everyone will need every test.

Your healthcare team will recommend the tests that are most appropriate based on your symptoms, medical history, and individual situation. Together, these results help create a personalized treatment plan that is tailored to your specific type of lung cancer.

Why is Lung Cancer Research Important?

Lung cancer research has led to significant advances in how lung cancer is diagnosed, treated, and managed. Research helps healthcare teams better understand how different types of lung cancer develop, why treatments work differently for different people, and how care can become more personalized over time.

Understanding Biomarkers and Precision Medicine

Every person's lung cancer is different. Biomarker testing and precision medicine help healthcare teams better understand the unique characteristics of a person's cancer and choose treatments that may be most appropriate. One of the most important advances in lung cancer care is biomarker testing.

What are Biomarkers?

Biomarkers are biological clues found in tumors, blood, genes, or proteins that may help healthcare teams better understand how a person's cancer may behave, and predict how it may respond to certain treatments, and identify which treatment approaches may be most appropriate.

Examples:

EGFR

ALK

KRAS

ROS1

BRAF

HER2

PD-L1

MET

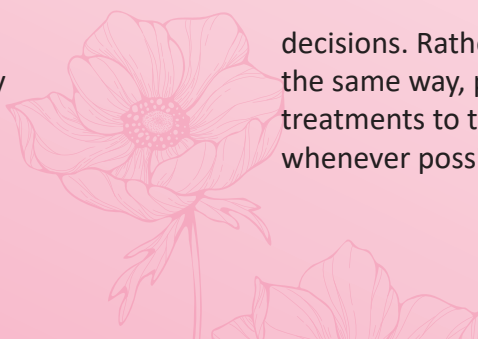
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Biomarker testing may help healthcare teams:

- Identify targeted therapies
- Guide treatment planning
- Predict treatment response
- Determine clinical trial eligibility
- Personalize treatment decisions

Precision medicine is an approach to care that uses information about a person's cancer including biomarkers, genetic changes, and other characteristics to help guide treatment

decisions. Rather than treating every lung cancer the same way, precision medicine helps match treatments to the biology of an individual's cancer whenever possible.



Biomarker testing may use tumor tissue and/or a liquid biopsy (blood test) and may include next-generation sequencing (NGS) and protein testing, such as PD-L1.

Genomic testing

Molecular profiling

Next-Generation Sequencing (NGS)

Liquid biopsy testing

Because lung cancer treatment continues to evolve rapidly, understanding your biomarker results can be an important part of understanding your options.

Questions to Ask About Biomarker Testing

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| ☐ Has my tumor been tested for biomarkers? | ☐ Could my results affect treatment decisions? |
| ☐ Which biomarkers were tested? | ☐ Am I eligible for targeted therapies? |
| ☐ What do my results mean? | ☐ Are there clinical trials based on my biomarker profile? |
| ☐ Are additional tests recommended? | |

Understanding Staging

After lung cancer has been diagnosed, healthcare providers determine its stage. Staging describes how much cancer is present, where it is located, and whether it has spread to other parts of the body.

Staging helps healthcare teams understand how advanced the cancer is:

- Recommend the most appropriate treatment options
- Determine whether surgery may be possible
- Identify potential clinical trial opportunities
- Monitor response to treatment

Even within the same stage, lung cancers may behave differently depending on biomarkers and tumor biology.



Treatment options may include

Surgery

Radiation therapy

Chemotherapy

Immunotherapy

Targeted therapy

Combination therapies

Supportive or palliative care

Clinical trials

Healthcare teams work together to determine the most appropriate treatment approach based on your diagnosis, biomarker results, overall health, and personal preferences.

Many treatment plans combine more than one approach. Your healthcare team will discuss the potential benefits, risks, and goals of each option to help you make informed decisions about your care.

Clinical Trials in Lung Cancer

Lung cancer research continues to evolve rapidly. Clinical trials help researchers evaluate new approaches to prevention, diagnosis, and treatment, including targeted therapies, immunotherapies, and biomarker-driven care.

Because biomarkers play an important role in many types of lung cancer, some clinical trials may require biomarker testing to determine eligibility or help match participants with specific treatments. If you are interested in learning more, ask your healthcare team whether a clinical trial may be appropriate for you at any stage of your care journey.

For more information about clinical trials, please refer to the "Understanding Clinical Trials" resource.

Emotional Well-Being

A lung cancer diagnosis can affect emotional, social, and practical aspects of daily life. Support is available through counseling, peer support, survivorship resources, advocacy organizations, and your healthcare team.

For additional information and support resources, please refer to the Mental Health & Well-Being resource.

Disclaimer: This information is provided for educational purposes only and is not intended to replace medical advice, diagnosis, or treatment. Treatment decisions should be made in consultation with your healthcare team. Medical knowledge and treatment recommendations may change over time.



SPARK is committed to empowering individuals through education, trusted resources, and equitable access to cancer clinical trials and personalized cancer care.

