


What you need to know about...

lung adenocarcinoma






LUNGEVITY

foreword

About LUNGevity

LUNGevity is the largest national lung cancer-focused nonprofit, changing outcomes for people with lung cancer through research, education, and support.

About the LUNGevity PATIENT EDUCATION SERIES

LUNGevity has developed a comprehensive series of materials for patients/survivors and their caregivers, focused on understanding how lung cancer develops, how it can be diagnosed, and treatment options. Whether you or someone you care about has been diagnosed with lung cancer, or you are concerned about your lung cancer risk, we have resources to help you.

The medical experts and lung cancer survivors who provided their valuable expertise and experience in developing these materials all share the belief that well-informed patients make their own best advocates.

In addition to this and other brochures in the LUNGevity patient education series, information and resources can be found on LUNGevity's website at www.LUNGevity.org, under "About Lung Cancer" and "Support & Survivorship."

This patient education booklet was produced through a charitable donation from:

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introduction

Lung adenocarcinoma accounts for about 40% of all lung cancers. It tends to grow more slowly than other kinds of lung cancer. There are numerous treatment options available to people affected by lung adenocarcinoma, and doctors are working hard to develop and improve these treatments.

This brochure will help you:

- Learn about lung adenocarcinoma
- Understand the treatment options available for lung adenocarcinoma
- Consider whether participating in a clinical trial might be right for you
- Understand how to manage the side effects associated with lung cancer treatment

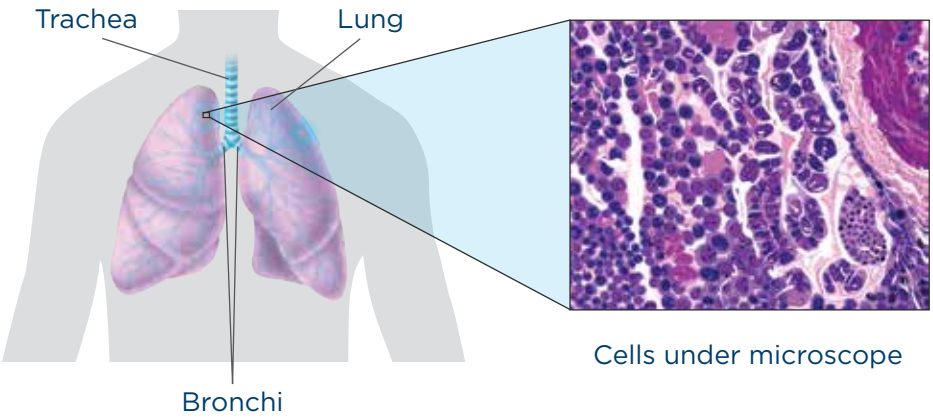
YOU'LL FIND A GLOSSARY TOWARD THE END OF THIS BROCHURE.
Words included in the glossary appear **blue** the first time that they are used in the text.

01 understanding lung adenocarcinoma

What is lung adenocarcinoma?

Adenocarcinoma is a subtype of **non-small cell lung cancer (NSCLC)**. It tends to develop in smaller airways, such as bronchioles, and is usually located more along the outer edges of the lungs.

LUNG ADENOCARCINOMA



Adenocarcinoma is a cancer that begins in cells in the glands. Glandular cells are found in the lungs and some other internal organs. Most cancers of the breast, pancreas, prostate, and colon are also adenocarcinomas. Only adenocarcinoma that begins in the lungs is considered lung cancer.

Diagnosis of lung adenocarcinoma

How is lung adenocarcinoma diagnosed?

Your doctors may use many different tests to diagnose lung cancer and determine whether it has spread to other parts of the body. Some can also help to decide which treatments might work best. The steps and tests used in diagnosing lung adenocarcinoma include:

- Imaging tests
- Laboratory tests
- Biopsies

Not all of these will be used for every person. The approaches used for an individual will depend on your medical history and condition, symptoms, location of the **nodule**(s), and other test results.

Imaging Tests

Imaging tests create pictures of the inside of the body by using **X-rays**, magnetic fields, sound waves, or radioactive particles.

Imaging tests cannot confirm that a person has lung cancer. However, they provide a lot of information to help put the whole picture together for the doctor. Imaging tests may be done before a diagnosis of lung cancer, during treatment for lung cancer, and after treatment.

They are done for a number of reasons, including:

- To get more specific information about a suspicious area that might be cancerous
- To determine how far cancer may have spread
- To find out if treatment has been effective
- To monitor for possible signs of cancer coming back after treatment

Various imaging types are available.

Chest X-ray

A chest X-ray takes pictures of the bones and organs in the chest. A chest X-ray is often the first test a doctor uses to look for a mass when symptoms are more general.

Computed tomography (CT or CAT) scan

Computed tomography (CT) uses a computer linked to an X-ray machine to make detailed pictures of the inside of the body. Unlike a conventional X-ray, which takes one picture, a CT scanner takes multiple pictures as it rotates around the patient, in order to get images from different angles. A CT scan can provide specific information about the size, shape, and position of masses or nodules in the lung. It also can help find enlarged **lymph nodes** or masses in other organs that might be caused by the spread of lung cancer. A **low-dose CT (LDCT) scan** is most commonly used to look for lung cancer and follow up on changes in lung nodules.

Magnetic resonance imaging (MRI) scan

Magnetic resonance imaging scans provide detailed pictures of areas inside the body by using radio waves and strong magnets. MRI is used in lung cancer to find out whether the cancer has spread to the brain or spinal cord.

Positron emission tomography (PET) scan

A positron emission tomography (PET) scan is used to help determine whether an abnormal area on a chest X-ray or CT scan may be cancer. It is also used to check whether cancer has spread to lymph nodes, bones, or other organs in the body. For a PET scan, a form of radioactive sugar is given **intravenously** to the patient. Because cancer cells grow rapidly, they absorb more of the sugar than most healthy cells. A scanner then creates images of the inside of the body to show what "lights up" with the sugar.

Some hospitals and radiology centers have a special scan called a positron emission tomography-computed tomography (PET-CT) scan that is able to do a PET and a CT scan at the same time. This allows the doctor to compare areas of radioactivity on the PET scan with the more detailed appearance of that area on the CT scan.

Bone scan

A bone scan also uses a small amount of a radioactive **tracer**, which is injected into a vein. The tracer settles in areas of the bone that have suffered injury, such as injury caused by cancer. The scanner then creates a picture of the skeleton. The injured parts look darker. Since PET scans also pick up cancer in the bones, they are usually used in place of a bone scan in lung cancer.

Laboratory Tests

Doctors may also order one or more kinds of laboratory tests to help determine if a person has lung cancer.

Blood tests

Blood tests do not diagnose lung cancer, but they provide a doctor with information on a patient's overall health and on how well the organs of the body are functioning.

For example, **blood chemistry tests** are used to check whether a patient's liver or kidneys are working well. The results from these blood tests help the doctor to decide on treatment options.

Sputum cytology

If lung cancer is suspected, testing of **sputum** for cancer cells may be performed. The patient may be asked to cough up **phlegm** so a **pathologist** can look at it under a microscope. A pathologist can locate cancer cells in the mucus, but most of the time there are not enough cells to make a final diagnosis of lung cancer. Sputum cytology is more likely to help diagnose lung cancers that start in the major airways of the lung. It does not provide information on how far the disease has spread. So, if it shows lung cancer, other diagnostic tests must be performed.

Biopsies

There are many different ways doctors can obtain tissue to find out if a person has lung cancer and, if so, which type of lung cancer. Depending on which method is used, the doctor can also determine whether the cancer has spread to lymph nodes or other organs. The tissue or fluid that is removed is sent to a pathologist, who examines it and then issues a **pathology report** with his or her findings.

Having enough tissue available for **molecular testing** (which you may also hear called **biomarker** testing, genetic testing, or **mutation** testing) can also be an important consideration. These tests can help identify whether your cancer is a match for a specific targeted therapy. Several targeted therapies for adenocarcinoma are either FDA-approved or available through clinical trials. *Before* a biopsy is done, the patient should speak with his or her doctor about having molecular testing of the **tumor** sample.

Bronchoscopy

During a bronchoscopy, a surgeon or **pulmonologist** inserts a bronchoscope (a thin, flexible tube) into the patient's mouth or nose, down the **trachea**, or windpipe, and into the lungs. A light and a camera at the end of the tube allow the doctor to look for abnormal areas. Tiny tools can be passed down through the bronchoscope to take samples of tissue.

Transthoracic needle biopsy

If a suspicious mass is in the **periphery** of the lungs, a needle can be passed though the chest wall with CT or **ultrasound** guidance to sample tissue or remove suspicious fluid. A specialist called an **interventional radiologist** performs the procedure. When a small needle is inserted through the skin of the chest wall, it is called a **fine needle aspiration (FNA)**. If a larger sample is needed, a **core biopsy** is done with a larger needle.

Note: A core biopsy is usually preferred over FNA for molecular testing.

Thoracentesis

If a patient has a **pleural effusion**, doctors can perform a thoracentesis to see if it was caused by cancer that spread to the linings of the lungs. In this procedure, a doctor numbs the skin and then inserts a hollow needle between the ribs to drain the fluid, which can then be sent to the pathologist for testing.

Thoracoscopy

A surgeon makes a small incision in the skin of the chest wall and inserts a special instrument with a small video camera on the end to examine the lungs and inside of the chest and to remove samples of tissue. This procedure is also referred to as video-assisted thoracoscopic surgery (VATS) and is performed in the operating room under general anesthesia.

A thoracoscopy can be used:

- To sample tumors and lymph nodes on the outer parts of the lungs
- To see if lung cancer has spread to the spaces between the lungs and the chest wall
- To check if the tumor has spread to nearby lymph nodes and organs
- As part of the treatment to remove part of a lung in some early-stage lung cancers

Mediastinoscopy

This procedure is performed to get biopsies from the **mediastinum**. A surgeon makes a small incision in the front of the neck at the top of the breastbone. Then a thin, hollow tube with a light and a lens for viewing is inserted through the incision, along the front edge of the windpipe. Instruments are passed through the tube to take samples from the lymph nodes along the trachea. A mediastinoscopy requires general anesthesia and is performed in an operating room. Usually it is an outpatient procedure.

Stages of lung cancer

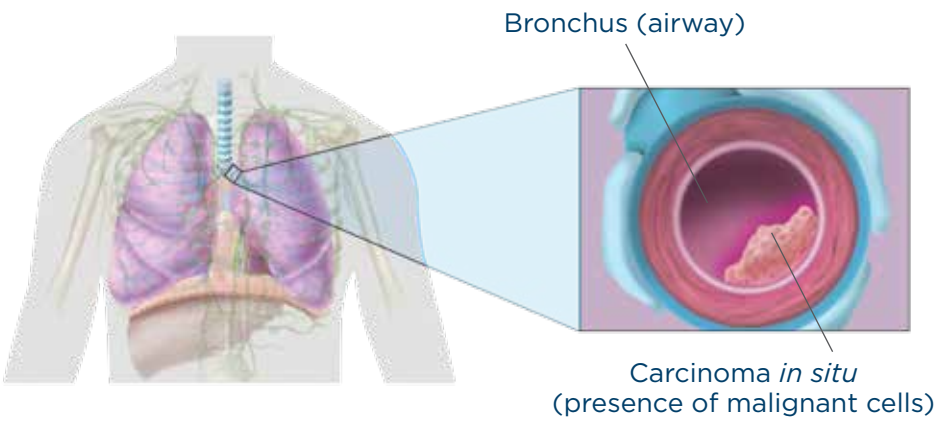
Staging is a way of describing where the cancer is located, if or where it has spread, and whether it is affecting other parts of the body. Doctors use diagnostic tests to determine the cancer's stage, so staging may not be complete until all of the tests are finished. Knowing the stage helps the doctor to recommend a treatment plan.

The stage of non-small cell lung cancer is described by a number, zero through four (Roman numerals I through IV are usually used).

Stage 0

Also called *in situ* disease, meaning the cancer is "in place" and has not invaded nearby tissues and spread outside the lung.

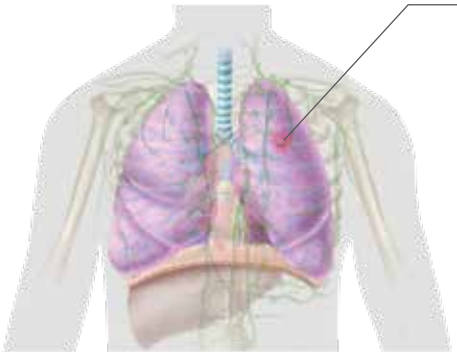
LUNG CANCER: STAGE 0



Stage one (I)

A small lung cancer tumor that has not spread to any lymph nodes. This tumor may be surgically removed, if the patient is healthy enough. Stage I is divided into two substages: stage IA and stage IB, based on the size of the tumor. Smaller tumors, such as those less than 3 centimeters (cm) wide, are stage IA, and slightly larger ones (more than 3 cm but less than 5 cm wide) are stage IB.

LUNG CANCER: STAGE IA

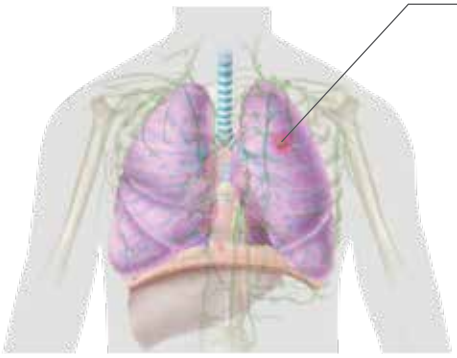


Tumor **less than 3 cm** in the greatest dimension

AND

Cancer **has not spread** to any lymph nodes

LUNG CANCER: STAGE IB



Tumor **more than 3 cm but less than 5 cm** in the greatest dimension

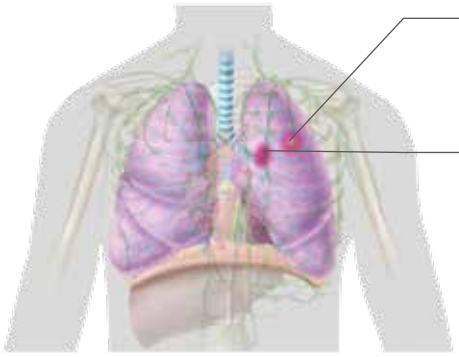
AND

Cancer **has not spread** to any lymph nodes

Stage two (II)

Stage II is divided into two sub-stages: stage IIA and stage IIB. Stage IIA is characterized by a small tumor (less than 5 cm wide) that has spread to the nearby lymph nodes, or by a tumor that is larger than 5 cm but less than 7 cm wide that has not spread to the nearby lymph nodes.

LUNG CANCER: STAGE IIA

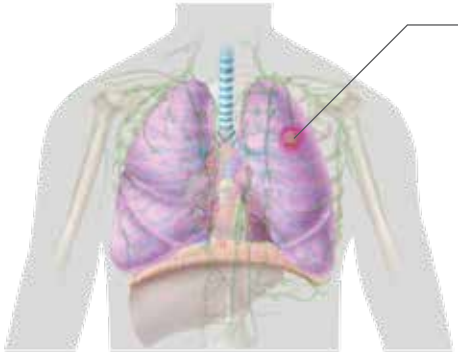


Tumor **less than 5 cm** in the greatest dimension

AND

Cancer **has spread** to regional lymph nodes

OR



Tumor **more than 5 cm but less than 7 cm** in the greatest dimension

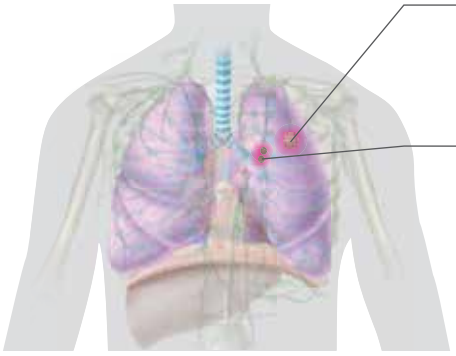
AND

Cancer **has not spread** to any lymph nodes

Stage IIB is characterized by a tumor that is larger than 5 cm but less than 7 cm wide that has spread to the lymph nodes, or a larger tumor (more than 7 cm wide) that may or may not have invaded nearby structures in the lung but has not spread to the lymph nodes.

Sometimes stage II tumors can be removed with surgery, and other times other treatments are needed.

LUNG CANCER: STAGE IIB

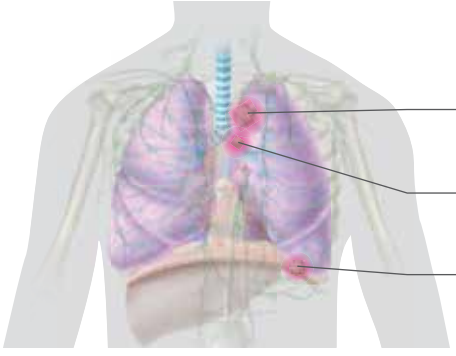


Tumor **more than 5 cm but less than 7 cm** in the greatest dimension

AND

Cancer **has spread** to regional lymph nodes

OR



Cancer **has not spread** to any lymph nodes

AND

Tumor **more than 7 cm**

OR

Tumor in the **main bronchus**

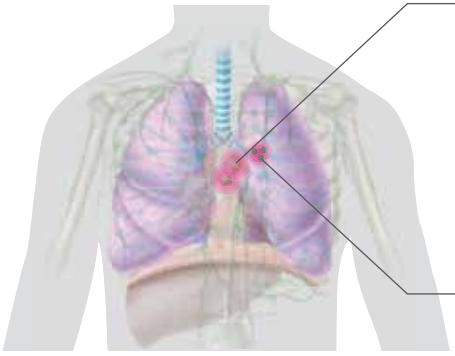
OR

Tumor **directly invades diaphragm** (or any other nearby organs)

Stage three (III)

Stage III cancers are classified as either stage IIIA or stage IIIB. Many stage IIIA cancers and nearly all stage IIIB cancer tumors are difficult, and sometimes impossible, to remove through surgery alone. For example, the lung cancer may have spread to the lymph nodes located in the center of the chest, or the tumor may have invaded nearby structures in the lung. Patients with stage III cancers will usually need a combination of at least two treatments, such as surgery, chemotherapy, or radiation.

LUNG CANCER: STAGE IIIA

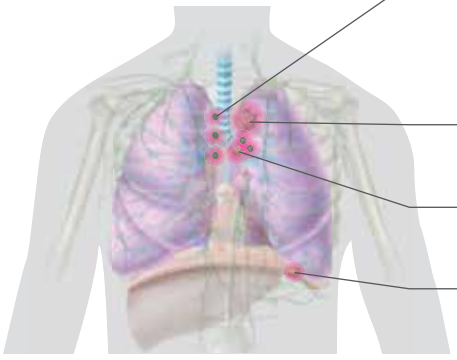


Tumor of any size that **invades the heart**(and/or the great vessels, mediastinum, trachea, recurrent laryngeal nerve, esophagus, vertebral body, carina, separate tumor nodule(s) in a different ipsilateral lobe)

AND

Cancer **has spread** to regional lymph nodes

OR



Cancer **has spread** to lymph nodes in center of the chest and outside and inside the lung

AND

Tumor **more than 7 cm**

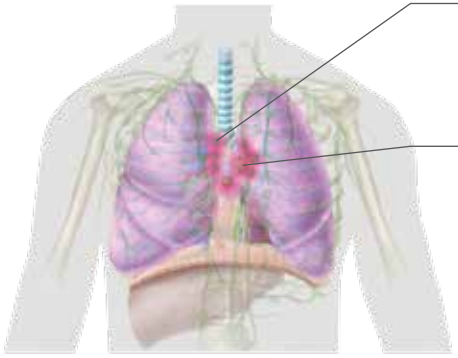
OR

Tumor in the **main bronchus**

OR

Tumor **directly invades diaphragm** (or any other nearby organs)

LUNG CANCER: STAGE IIIB

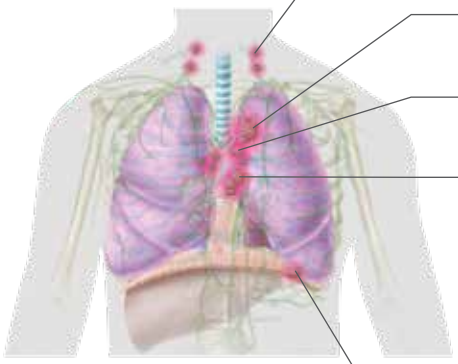


Cancer **has spread** to lymph nodes in center of the chest and inside the lung

AND

Tumor of any size that **invades the heart** (and/or the great vessels, mediastinum, trachea, recurrent laryngeal nerve, esophagus, vertebral body, carina, separate tumor nodule(s) in a different ipsilateral lobe)

OR



Cancer **has spread** to contralateral lymph nodes above the clavicle and inside and outside of lungs

AND

Tumor **more than 7 cm**

OR

Tumor in the **main bronchus**

OR

Tumor of any size that **invades the heart** (and/or the great vessels, mediastinum, trachea, recurrent laryngeal nerve, esophagus, vertebral body, carina, separate tumor nodule(s) in a different ipsilateral lobe)

OR

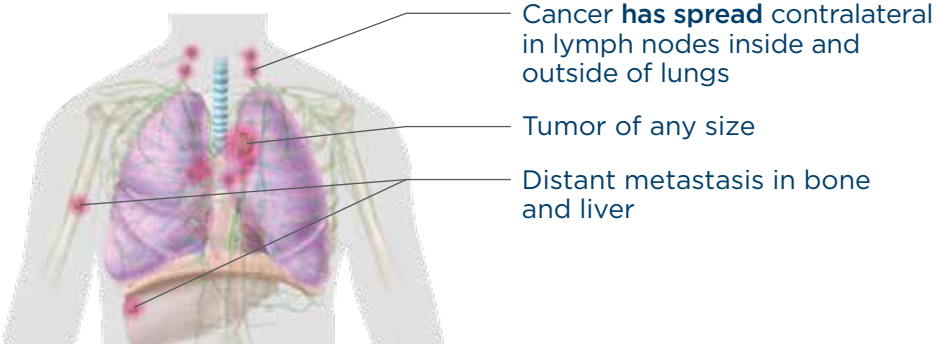
Tumor directly **invades diaphragm** (or any other nearby organs)

Stage four (IV)

The lung cancer has spread to either:

- The opposite lung
- The fluid surrounding the lung or the heart
- Distant parts of the body by way of the bloodstream

LUNG CANCER: STAGE IV



Once released in the blood, lung cancer can spread anywhere in the body, but it is more likely to spread to the brain, bones, liver, and adrenal glands. It is classified as stage IVA when the cancer has spread within the chest and IVB when it has spread outside of the chest.

In general, surgery is not successful for stage IV lung cancers. Lung cancer can also be impossible to remove if it has spread to the lymph nodes above the collarbone, or if the cancer has grown into vital structures within the chest, such as the heart, large blood vessels, or the main breathing tubes leading to the lungs. In cases like these, the doctor will recommend other treatment options.

Recurrent lung cancer is lung cancer that has come back after treatment. If there is a recurrence, the cancer may need to be staged again (called restaging) using the system above.

Usually, patients with recurrent cancer are treated like patients with stage IV cancer.

Note: You may also hear about the TNM classification, because the stages mentioned previously have been developed based on a combination of T (the size of the primary tumor), N (whether and how regional lymph nodes are affected by the cancer), and M (whether there is distant **metastasis**).

Biomarker profile

Lung cancer describes many different types of cancer that start in the lung or related structures. There are two different ways of describing what kind of lung cancer a person has:

- Histology—what the cells look like under a microscope. Adenocarcinoma is a histological subtype of non-small cell lung cancer. Other subtypes of non-small cell lung cancer include **squamous cell lung cancer**, **large cell carcinoma**, and some rarer types. **Small cell lung cancer (SCLC)** is the other major type of lung cancer
- Biomarker profile (also called molecular profile, genetic profile, or signature profile)—the genetic characteristics or mutations, as well as any other unique biomarkers, found in a person's cancer that allowed the cancer to grow

Note: Genetic biomarkers can be:

- Acquired—present only in the tumor and not passed on to children
- Inherited—present in all cells of the body and passed on to children

Most of the genetic biomarkers that are helpful to making treatment decisions in lung cancer are *acquired* (sometimes called somatic). Inherited biomarkers are still being researched.

A person's lung cancer may or may not have one of the many known mutations or other molecular biomarkers. For example, two patients may be treated with two different therapies because of their own cancer's specific mutation or lack of a mutation.

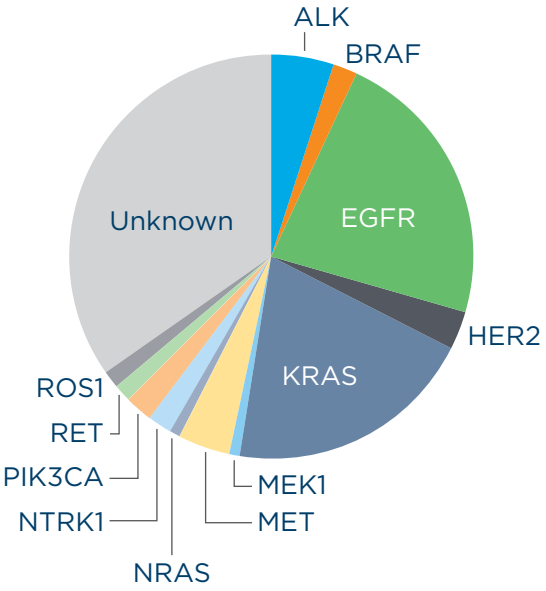
Non-genetic biomarkers are also important and can help determine the best treatment. In particular, your doctor may want to look at a **protein** called **PD-L1**, which may be helpful in choosing immunotherapies.

Researchers are making progress in understanding mutations in adenocarcinoma. Several therapies targeting these mutations are approved for use as **first-line treatment** (and later) in adenocarcinoma, and others are being studied in clinical trials.

The decision to test for mutations should be made together by you and your **oncologist**.

Here are the adenocarcinoma mutations that have been identified at this time.

MOLECULAR PROFILE OF ADENOCARCINOMA



Frequency of driver mutations in NSCLC	
ALK	3–7%
BRAF	1–3%
EGFR	10–35%
HER2	2–4%
KRAS	15–25%
MEK1	1%
MET	4%
NRAS	1%
NTRK1	1–3%
PIK3CA	1–3%
RET	1–2%
ROS1	1–2%

02 treatment options for lung adenocarcinoma

What are currently approved treatment options for lung adenocarcinoma?

There are a number of currently approved treatment options for adenocarcinoma. These include:

- Surgery
- Radiation therapy
- Chemotherapy
- Targeted cancer therapy
- Angiogenesis inhibitors
- Immunotherapy

The treatments chosen for a specific patient's lung cancer will depend on the stage of the cancer and the patient's overall health and preferences. The stage indicates where the cancer is in the lung and whether it has spread to other parts of the body.

It is important to note that a patient's age has never been useful in predicting whether that patient will benefit from treatment. A patient's age should never be used as the only reason for deciding what treatment is best. This is especially true for older patients who are otherwise physically fit and have no medical problems besides lung cancer.

QUESTIONS TO DISCUSS WITH YOUR HEALTHCARE TEAM WHEN PLANNING YOUR TREATMENT APPROACH:

- What are my treatment options?
- What treatment plan do you recommend for me?
- What is our goal with these treatment(s)? To eliminate my cancer? To slow its growth? To treat symptoms?
- How long will my treatment take?
- When do I need to decide on my treatment plan?
- What are the risks and potential side effects of the different treatment options?
- Will my insurance cover these treatment options?

The following is more information about treatment options that are currently approved for lung adenocarcinoma.

Surgery

Lung cancer that is only in one lung and that has not spread to other organs is often treated with surgery, if the patient can tolerate it. Patients should discuss with their healthcare team whether surgery is the best option for them. Lung cancer surgery is a complex operation that can have serious consequences. Therefore, it should be done by a thoracic surgeon—a surgeon specially trained in operating on people with lung cancer. Patients often seek a second opinion with a thoracic surgeon when considering surgery.

Lung cancer surgery may be used in combination with chemotherapy and/or radiation therapy. Chemotherapy and/or radiation therapy may be given either before surgery (**neoadjuvant**) or after surgery (**adjuvant**) in order to eliminate any small amount of cancer that was not detected and removed by surgery.

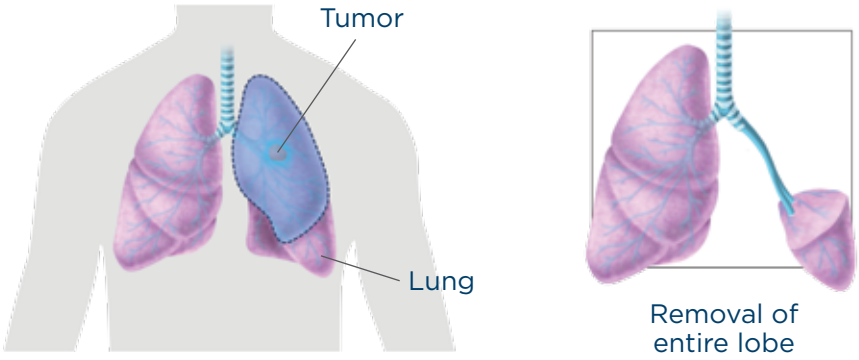
The type of surgery the doctor recommends depends on the size and location of the tumor and on how well the patient's lungs are working. If a patient's lungs are healthy, a lobectomy is most commonly the preferred operation. Removing more of the lung tissue may provide a better chance to cure the lung cancer.

Other types of surgeries may also be performed to treat lung cancer that is only in one lung and has not spread to other organs. Removal of part or all of a lung will decrease your lung function. Talk to your healthcare team about what you can do before and after surgery to manage that for best quality of life. Pulmonary rehabilitation, for example, may be an option for you.

Lobectomy

Lobectomy is the removal of one of the five lobes of the lung. When non-small cell lung cancer is detected at a very early stage, a lobectomy is the most effective type of surgery, even when the lung tumor is very small.

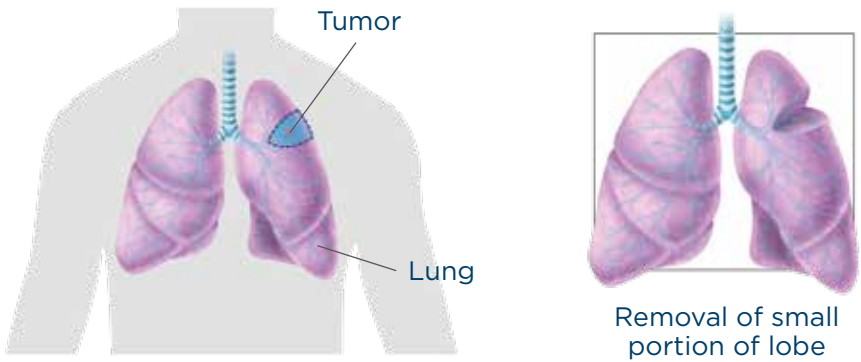
LOBECTOMY



Wedge resection

In a wedge resection, the surgeon removes the tumor and a small rim of normal tissue surrounding it. This is done if the surgeon is unable to remove an entire lobe of the lung. A wedge resection may also be performed if the patient has a peripheral lesion.

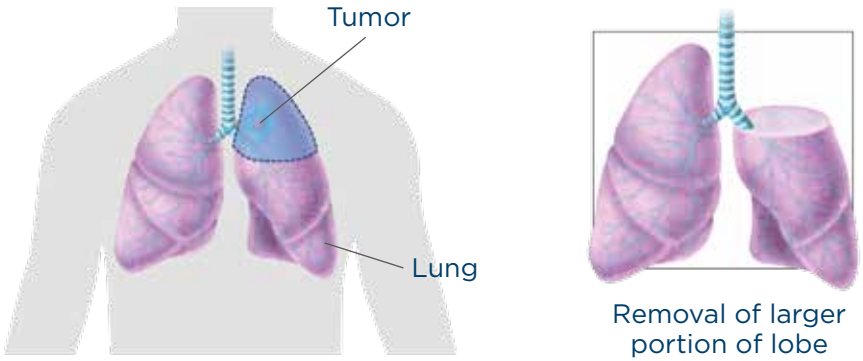
WEDGE RESECTION



Segmentectomy

A segmentectomy removes one of the small segments within the lobes of the lung that contains a cancer. The amount of lung tissue removed is between what is removed in a lobectomy and in a wedge resection. Like wedge resection, it is recommended only for treating stage I lung cancers that are less than 2 cm wide and for elderly patients or those with other medical conditions that make removing the entire lobe dangerous.

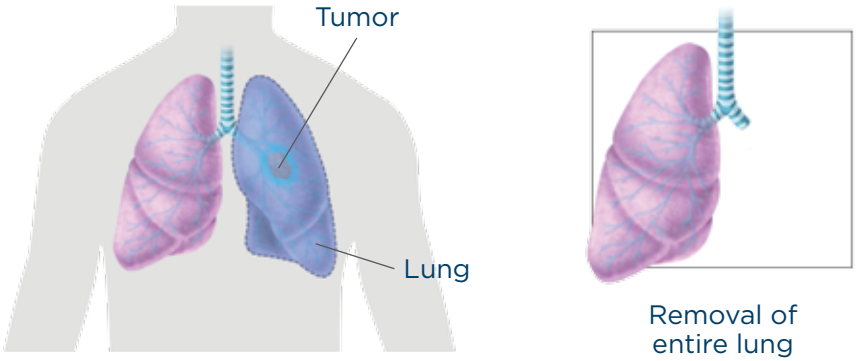
SEGMENTECTOMY



Pneumonectomy

Pneumonectomy is the surgical removal of the entire lung. This type of surgery is sometimes required if the tumor is very large or is close to the center of the chest.

PNEUMONECTOMY



Sleeve resection

This surgery is used for tumors that involve the large airways. The tumor and a portion of the airway are removed and the ends of the airway are rejoined so the remaining lobes can be left in place. A surgeon may do this operation instead of a pneumonectomy to preserve more lung function.

SLEEVE RESECTION

Radiation therapy

Radiation therapy is a type of cancer treatment that uses high-powered energy beams, such as X-rays, to kill cancer cells. Depending on the individual patient's situation, radiation therapy may be used when trying to cure cancer, control cancer growth, or relieve symptoms caused by the tumor, such as pain. In some cases, radiation therapy is used before or after surgery. Radiation treatment can also be given as the main treatment in early-stage lung adenocarcinoma if surgery is not possible. In that case, it may be given either with or without chemotherapy.

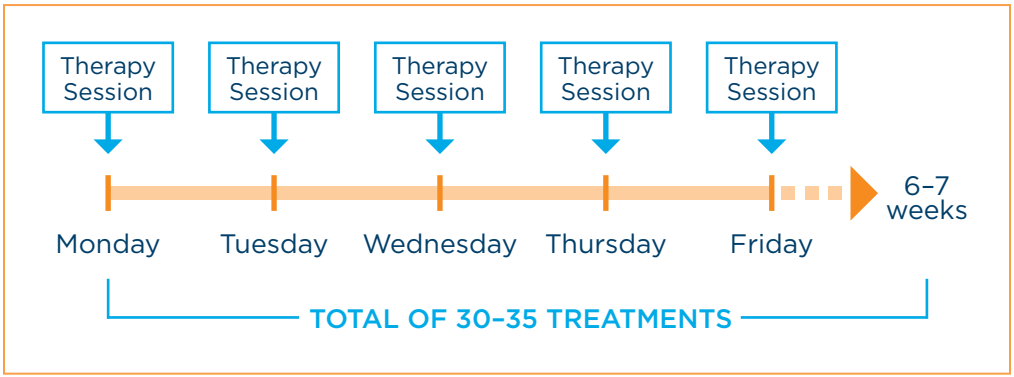
Radiation therapy is administered by a radiation oncologist, a doctor who specializes in using radiation treatments to treat cancer.

Radiation therapy can be roughly classified by the position of the radiation source. Radiation can come from a machine outside the body (external beam radiation therapy, or EBRT) or from radioactive material placed in the body (internal radiation therapy, more commonly called brachytherapy). EBRT is more commonly used to treat lung cancer, so we will discuss it in more detail.

For EBRT, the radiation oncologist takes careful measurements to determine the proper dose of radiation and the correct angles for aiming the radiation beams. Treatment is similar to getting an X-ray, but the radiation dose is stronger. Each radiation therapy session is usually painless and only lasts a few minutes.

A radiation therapy schedule usually consists of a specific number of treatments given over a set period of time. For example, a standard course for lung cancer may consist of sessions 5 days per week (Monday–Friday) for 6 to 7 weeks, for a total of 30 to 35 treatments.

RADIATION THERAPY TO TREAT LUNG CANCER



In patients with early-stage non-small cell lung cancer, in which there is only a single small nodule in the lung without any spread to nearby lymph nodes, a type of EBRT called **stereotactic body radiation therapy (SBRT)**, or stereotactic ablative radiotherapy (SABR), is typically given. SBRT is the standard of care for patients who cannot be treated surgically.

Various devices can be used to deliver these treatments, including Accuray's CyberKnife and TomoTherapy, as well as linear accelerators by Varian (e.g., Novalis Tx, Trilogy and TrueBeam) and Elekta (e.g., Versa HD). Your radiation oncologist can tell you which device their facility uses.

In more advanced stages of non-small cell lung cancer, EBRT can be given alone or along with chemotherapy as the main treatment. EBRT can be used prior to surgery, as neoadjuvant therapy—typically along with chemotherapy—to try to shrink a lung tumor to make it easier to operate on. It is also used after surgery, alone or along with chemotherapy, to try to kill any small deposits of cancer that surgery may have missed.

Both external beam and internal radiation therapies can be used to shrink tumors to relieve symptoms of advanced lung cancer, such as pain, bleeding, trouble swallowing, cough, and shortness of breath.

Common side effects from radiation treatment for lung cancer may include:

- Tiredness
- Sunburn-like skin changes, such as dryness, itching, or peeling
- Hair loss (in the area where the radiation enters the body)
- Sore throat and trouble swallowing
- Cough, difficulty breathing, and shortness of breath
  - These symptoms can develop as "radiation pneumonitis." When it happens, it usually happens months after radiation was finished and may require anti-inflammatory medication
- Loss of appetite and weight loss
- Nausea and vomiting (when the treated area is near the stomach)

Most of these side effects go away within a few weeks after radiation treatment is done.

Chemotherapy

Chemotherapy is a word that describes many different cancer treatments that are given in drug form. Here, chemotherapy is used specifically to describe intravenous drugs that are designed to kill cancer cells. We will discuss other drug therapy options, like targeted therapies, angiogenesis inhibitors, and immunotherapy in different sections. Your doctor will help to select the best treatment based on your medical history and fitness.

Chemotherapy is used in two main ways for patients with lung cancer:

- For those patients with cancer that involves the lung and some lymph nodes (stages II or III), chemotherapy is used to improve the chance of cure.

  For patients with stage II or III lung cancer who have had a surgery for their lung cancer, patients typically receive chemotherapy after surgery for a defined period of time (usually 4 cycles, which can last anywhere from 12 to 16 weeks). This treatment after surgery is called adjuvant therapy. If their doctors recommend it, patients sometimes receive this chemotherapy before surgery, as neoadjuvant. In either case, platinum-based chemotherapy is usually used.

  In other patients with stage III lung cancer, chemotherapy is combined with radiation therapy. Many different chemotherapies can be combined with radiation therapy.
- For patients with stage IV lung cancer, chemotherapy is used to shrink the cancer, reduce symptoms from cancer, and prolong life.

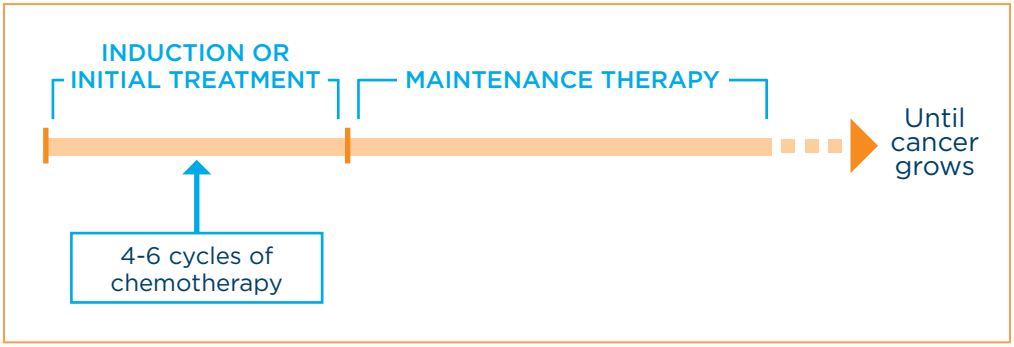
As with other types of non-small cell lung cancer, patients with lung adenocarcinoma are often given two chemotherapy agents as first-line therapy. Which drugs are chosen will depend in part on the patient's overall health and ability to tolerate different possible side effects.

Most often, the platinum drugs, cisplatin or carboplatin, are combined with another chemotherapy drug. Several combinations are used for patients with lung adenocarcinoma:

- Cisplatin or carboplatin and pemetrexed (Alimta®)
- Cisplatin or carboplatin and docetaxel
- Carboplatin and paclitaxel
- Carboplatin and nab-paclitaxel (Abraxane®)

People with late-stage (stage IV) lung cancer whose cancer shrank or stopped growing after initial chemotherapy treatment may be offered **maintenance therapy**. The goal of maintenance therapy is to help keep the cancer from growing again. Generally, a person is kept on maintenance therapy as long as the cancer stays controlled.

MAINTENANCE THERAPY TO TREAT LUNG CANCER



Another approach after induction/initial therapy is to stop treatment after the initial treatment. Then the cancer is carefully monitored by the oncologist, and **second-line treatment** is given if there is **disease progression**.

The second-line chemotherapy options for patients with lung adenocarcinoma include single chemotherapy agents, usually pemetrexed or docetaxel, depending on which treatment the patient has had before. Sometimes angiogenesis inhibitors are added to chemotherapy (see the "Angiogenesis inhibitors" section).

General side effects of chemotherapies as a group are listed below.

Each drug has a different set of most common side effects. It's important to remember that just because a side effect is possible doesn't mean that it will happen to you. Some side effects don't happen with some drugs. In general, chemotherapy side effects include:

- Diarrhea
- Constipation
- Tiredness
- Hair loss
- Dehydration
- Nausea and vomiting
- Skin and nail changes
- Muscle or joint pain
- Numbness, tingling, pain, or weakness in the hands or feet
- Low red blood cell or platelet count
- Loss of appetite or ability to taste food
- Swelling in the hands or feet

Note: Your healthcare team can help you manage side effects. Talk to them about any that you experience.

Targeted cancer therapy

Targeted cancer therapies are a type of therapy that aims to target cancer cells directly. They focus on specific parts of cells and the signals that cause cancer cells to grow uncontrollably and thrive. These drugs are often grouped by how they work or what part of the cell they target.

All of the targeted drugs that are FDA-approved belong to a class of drugs called tyrosine kinase inhibitors (TKIs). Tyrosine kinases are a type of protein. They have normal functions in your body, but may also signal cancer cells to grow.

Tyrosine kinase inhibitors are targeted cancer therapies that block these cell signals. By blocking the signals, they can kill some cancer cells, as well as keep the cancer from getting bigger or spreading.

Tyrosine kinase inhibitors are currently approved by the U.S. Food and Drug Administration (FDA) for people who have either **anaplastic lymphoma kinase (ALK)** or **epidermal growth factor receptor (EGFR) genetic mutations**.

Clinical trials are currently studying promising drugs to target many other genetic mutations.

Anaplastic lymphoma kinase (ALK) inhibitors

An anaplastic lymphoma kinase (ALK) rearrangement is a fusion between two genes: ALK and another gene, with the most common being **echinoderm microtubule-associated protein-like 4 (EML4)**. The combination of these two genes produces an abnormal ALK protein that causes cancer cells to grow and spread. When the lung cancer has an ALK rearrangement, it is called ALK-positive.

These ALK gene rearrangements happen in a small proportion (3–7%) of patients with lung adenocarcinoma. The following ALK inhibitors are currently FDA-approved for patients with ALK-positive **metastatic** non-small cell lung cancer, including adenocarcinoma:

- **Crizotinib (Xalkori®):** As first-line treatment
- **Alectinib (Alecensa®):** For patients whose cancer has grown while they were on crizotinib
- **Ceritinib (Zykadia™):** For patients whose cancer has grown while they were on crizotinib

Both alectinib and ceritinib are also approved for people who cannot tolerate crizotinib.

In addition, many other ALK inhibitors are currently being studied in clinical trials.

What are the side effects of ALK inhibitors?

The side effects of the specific ALK inhibitors can be very different for each drug and in individual patients.

The common side effects of ALK inhibitors as a group include:

- Nausea
- Diarrhea
- Vomiting
- Abdominal pain
- Constipation
- Feeling tired
- Muscle pain
- Decreased appetite
- Swelling of the hands or feet
- Liver damage (as shown by abnormal blood tests related to liver function)

Some of these side effects can be improved by reducing the dose of ALK inhibitors.

The most common side effect caused by crizotinib is difficulty with vision. This includes trouble looking at light, blurred vision, double vision, seeing flashes of light, or new and increased floaters.

These visual side effects usually come and go very quickly and will go away if crizotinib is stopped. People almost never stop treatment with crizotinib because of vision problems.

Alectinib and ceritinib do not have as frequent visual side effects, but have higher rates of some other common side effects.

Epidermal growth factor receptor (EGFR) inhibitors

Epidermal growth factor receptor (EGFR) is a protein found in abnormally high levels on the surface of some cancer cells. These high levels are due to mutations of the genes. When the lung cancer has the EGFR mutation, it is called EGFR-positive. Mutations involving EGFR can lead to uncontrolled cancer cell growth and survival. EGFR mutations occur in the lung cancer tumors for about 25% of people with non-small cell lung cancer.

There are currently three marketed EGFR inhibitors that are approved as first-line treatment for patients with metastatic EGFR-positive non-small cell lung cancer:

- Afatinib (Gilotrif™)
- Erlotinib (Tarceva®)
- Gefitinib (Iressa®)

Erlotinib is also approved for the following situations, for both EGFR-positive and EGFR-negative lung cancer:

- Maintenance therapy for patients with locally advanced or metastatic NSCLC whose cancer has not grown or spread after platinum-based chemotherapy
- Second-line or third-line treatment for patients with advanced-stage NSCLC whose cancer did not respond to prior chemotherapy

EGFR inhibitors have a few key side effects. The most common side effects of EGFR inhibitors include:

- Rash
- Diarrhea
- Loss of appetite
- Cough
- Itching
- **Stomatitis**
- Weakness

Note: Your healthcare team can help you manage side effects. Talk to them about any that you experience.

Acquired Resistance to TKIs

The biggest challenge of TKIs is that all patients with lung cancer who initially benefit from them eventually develop resistance. Acquired resistance is defined* as disease progression after initial benefit with a targeted cancer therapy.

* According to **Response Evaluation Criteria in Solid Tumors (RECIST)** or **World Health Organization (WHO) criteria**

Doctors and researchers are working to overcome resistance in tumors and to keep TKIs effective against cancer for longer periods of time.

For example, in order to decide on the next treatment option for a patient whose cancer has grown after treatment with an EGFR TKI, the doctor will usually recommend that a biopsy be done of one of the tumors that is growing. This tumor will need to be tested to see if there is a new mutation in EGFR. The EGFR T790M mutation occurs in about two-thirds of patients with EGFR-positive lung cancer who have had the cancer progress after initial treatment with erlotinib, gefitinib, or afatinib.

There is currently one FDA-approved EGFR inhibitor for patients with metastatic EGFR-positive NSCLC that also has the T790M mutations:

- Osimertinib (Tagrisso™):
  - As second-line or third-line treatment
  - For patients whose lung cancer has grown or spread on or after another EGFR TKI therapy

More information on targeted therapy, including on biomarker testing, can be found in LUNGevity's Targeted Cancer Therapy brochure.

Angiogenesis inhibitors

As the body develops and grows, it makes new blood vessels to supply all of the cells with blood. This process is called angiogenesis. When the new blood vessels provide oxygen and nutrients to cancer cells, they help the cancer cells grow and spread.

Angiogenesis inhibitors help stop or slow the growth or spread of tumors by stopping them from making new blood vessels. The tumors then die or stop growing because they cannot get the oxygen and nutrients they need. The way they do this is by blocking the cancer cells' **vascular endothelial growth factor (VEGF)** receptors.

Angiogenesis inhibitors are not effective given alone, but are most effective when combined with additional therapies, usually chemotherapy. Angiogenesis inhibitors do not kill tumors; they instead may prevent tumors from growing. Therefore, this type of therapy may need to be administered over a long period.

Currently, two angiogenesis inhibitors are FDA-approved for patients with non-small cell lung cancer, including adenocarcinoma:

- **Bevacizumab (Avastin®):** In combination with carboplatin and paclitaxel for the first-line treatment of patients with unresectable, locally advanced, recurrent, or metastatic adenocarcinoma
- **Ramucirumab (Cyramza®):** In combination with docetaxel for the second-line treatment of patients with metastatic NSCLC

Like any treatment, angiogenesis inhibitors can cause side effects. Each drug has a different set of most common side effects. It's important to remember that just because a side effect is possible doesn't mean that it will happen to you.

The most common side effects of VEGF inhibitors include:

- High blood pressure
- Headaches
- Swelling of the mucous membranes of the nose or mouth

Depending on the drug, side effects may also include:

- Diarrhea
- Tiredness
- **Neutropenia**
- Nose bleeds
- Taste alteration
- Dry skin
- Back pain
- High amounts of protein in the urine
- Bleeding from the rectum
- Problems with tearing of the eye
- Scaling of the skin

Note: Your healthcare team can help you manage side effects. Talk to them about any that you experience.

Immunotherapy

Immunotherapy aims to strengthen the natural ability of the patient's immune system to fight cancer. Some lung cancers may grow and spread by avoiding the immune response that would otherwise help to keep cancer cells in check. Instead of targeting the person's cancer cells directly, immunotherapy attempts to trigger a person's immune system to recognize cancer cells and selectively target and kill them.

Currently, there are two FDA-approved immunotherapy drugs for people with non-small cell lung cancer.

Nivolumab (Opdivo®) and pembrolizumab (Keytruda®) are both FDA-approved for people who have:

- Metastatic NSCLC
- Disease progression during or after treatment with platinum-based chemotherapy

Note: Platinum-based chemotherapies include cisplatin and carboplatin.

Pembrolizumab's approval also requires the following:

- The patient's tumors must express PD-L1
- And, for patients with ALK-positive or EGFR-positive NSCLC, the lung cancer should have progressed on an approved ALK or EGFR inhibitor before they are treated with pembrolizumab

Both drugs belong to the type of immunotherapy called **immune checkpoint inhibitors**. The immune checkpoint inhibitors work by targeting and blocking the fail-safe mechanisms of the immune system. Their goal is to block the immune system from limiting itself, so the immune system can target the cancer cells.

In addition, many other immunotherapies are currently being studied in clinical trials.

The most common side effects seen with these immunotherapy drugs are:

- Trouble breathing
- Cough
- Fatigue
- Musculoskeletal pain
- Nausea
- Constipation
- Decreased appetite

A rare side effect sometimes seen with immune checkpoint inhibitors is pneumonitis. This is inflammation of the lung tissues that may lead to difficulty breathing if not treated early and correctly.

Pneumonitis and some of the other side effects seen with immune checkpoint inhibitors are related to "turning on" the immune system, which then may also attack some healthy cells and cause inflammation. These are all relatively rare, but can be serious if left untreated. Other examples of this include:

- **Arthritis**
- **Colitis**
- **Hepatitis**
- **Nephritis**
- Inflammation of the **endocrine glands**, like the thyroid

Note: It's important to let your doctor or nurse know if you are experiencing any problems while on treatment, so they can sort out whether the side effects are related to treatment or not. It is also important to let your doctor or nurse know if you have a history of an autoimmune disease. This is because immune checkpoint inhibitors may make autoimmune diseases worse.

More information on immunotherapy can be found in LUNGevity's Immunotherapy brochure.

What clinical research study (clinical trial) treatment options are available for lung adenocarcinoma?

Clinical trials are an important option for people thinking about lung cancer treatments, because the newest treatment approaches are being tested in them. A lot of promising research is going on now in lung adenocarcinoma. *More information on clinical trials can be found in LUNGevity's Clinical Trials brochure.*

The following describe some, but by no means all, of the clinical trials available for people with adenocarcinoma.

Targeted cancer therapy

As discussed earlier, a number of mutations have been found in lung adenocarcinoma in addition to ALK and EGFR. These include BRAF, HER2, KRAS, MEK1, MET, NRAS, NTRK1, PIK3CA, RET, and ROS1. Currently, researchers are working to develop drugs that target most of these mutations.

Immunotherapy

Three main types of immunotherapy are currently being studied in clinical trials for people with all stages of non-small cell lung cancer:

- Immune checkpoint inhibitors by themselves or combined with other drugs
- **Therapeutic cancer vaccines**
- **Adoptive T cell transfer**

Immune checkpoint inhibitors, such as nivolumab and pembrolizumab, continue to be studied for treatment of earlier stages of lung cancer and in combination with other treatments. These other treatments include targeted therapy, chemotherapy, and radiation therapy.

New approaches to existing treatments

In addition to new treatments, doctors are also trying new approaches to existing treatments. Some examples include:

- Chemotherapy agents given in combination with radiation therapy, surgery, immunotherapy, and targeted cancer therapy
- Radiation therapy given in combination with chemotherapy and surgery
- Doctors are also looking at whether using imaging procedures, such as PET and CT scans, can help doctors guide radiation therapy so that higher doses can be delivered directly to the tumor, causing less damage to healthy tissue

Finding a clinical trial that might be right for you

If you are considering participating in a clinical trial, start by asking your healthcare team whether there is one that might be a good match for you in your geographic area. In addition, there are several resources to help you find one that may be a good match.

Information about available clinical trials may be found through the resources detailed on the following page.

In addition, if you are interested in a specific drug or other treatment that is being developed, you can often find information about studies for that drug on the website of the company developing it.

RESOURCES TO HELP YOU NAVIGATE YOUR CLINICAL TRIALS SEARCH:

- **EmergingMed**:
  www.emergingmed.com/networks/LUNGevity
  - LUNGevity partners with this **free** clinical trials matching service to help you with the decision of whether to participate in a clinical trial
  - EmergingMed helps you identify lung cancer clinical trials for which you may be eligible
  - Clinical trial navigators are available Monday through Friday from 8:30am to 6:30pm ET at 800-698-0931
- **LUNGevity Clinical Trial Finder:**
  www.LUNGevity.org/clinicaltrialfinder
  - Makes it easier to find available clinical trials by type of lung cancer and geographic location, and provides information and links to the medical centers at which these studies are taking place
  - This site gets its information from www.clinicaltrials.gov
- **U.S. National Institutes of Health:**
  www.clinicaltrials.gov
  - Includes publicly and privately supported clinical studies of human participants conducted in the U.S. and 186 other countries around the world in all different disease states
- **National Cancer Institute (NCI):**
  www.cancer.gov/clinicaltrials/search
  - This site has all of the 12,000+ clinical trials in the U.S. in all cancer types
- **Coalition of Cancer Cooperative Groups:**
  www.cancertrialshelp.org/cancer-trial-search
  - This site gets its information from www.clinicaltrials.gov, but organizes the search and results in a different way

03 managing symptoms and side effects

As already noted, lung cancer treatments can cause side effects. Some cancer therapy side effects are temporary, while others can be more long-term. When you start a new treatment, you should discuss with your doctor which potential side effects to expect, what can be done to manage them, and which side effects are serious and need to be reported immediately. Often, drugs can be prescribed to help reduce many of these side effects.

In addition to the side effects of lung cancer treatment, lung cancer itself can result in a number of symptoms.

The most common symptoms of lung cancer itself include:

- Pain in the chest, upper back, or shoulder
- Cough that doesn't go away or gets worse
- Coughing up blood or rust-colored sputum
- Frequent infections such as bronchitis and pneumonia
- Weight loss and loss of appetite
- Hoarseness
- New wheezing
- Shortness of breath
- Fatigue and weakness

To help reduce the severity and duration of most side effects and alleviate the cancer's symptoms, you may want to request palliative care, also called "supportive care" or "symptom management." There is sometimes confusion about the difference between palliative care and hospice care. Hospice care is a form of palliative care given only to patients whose life expectancy is six months or less, while palliative care in general is an extra layer of support that can be initiated alongside other standard medical care.

The goal of palliative care is to improve the patient's quality of life while he or she is receiving standard medical care by anticipating, preventing, and treating suffering. Palliative care can be provided from the time of diagnosis, and also addresses the emotional, social, practical, and spiritual issues that a patient faces. Scientific evidence is starting to emerge that shows that palliative care may actually help patients to live longer.

Note: Your oncology team can answer your questions about palliative care.

04 glossary

Adjuvant—Cancer treatment given after the primary treatment in order to kill unseen cancer cells or to lower the risk that the cancer will come back. Adjuvant therapy may include chemotherapy, radiation therapy, or biological therapy

Adoptive T cell transfer—Therapy that involves removing some of a patient's own immune-system cells—often altering and increasing their ability to recognize and kill cancer cells—growing billions of them in the laboratory and infusing the cultured cells into the patient. The idea is to provide an invading force of immune cells that can attack tumors at a level that the immune system is not capable of doing on its own. Also called "adoptive T cell therapy"

ALK—See anaplastic lymphoma kinase

Anaplastic lymphoma kinase (ALK)—A gene that the body normally produces but, when it fuses with another gene, produces an abnormal protein that leads to cancer cell growth

Arthritis—A disease that causes inflammation and pain in the joints

Biomarker—A biological molecule found in blood, other body fluids, or tissues that is a sign of a normal or abnormal process, or of a condition or disease

Blood chemistry tests—A common panel of blood tests that measures the amounts of electrolytes and other chemicals made in the body. It provides information on how the body's organs, such as kidneys, liver, and heart, are functioning

Colitis—An illness that causes pain and swelling in the colon

Core biopsy—The removal of a tissue sample with a wide needle for examination under a microscope. Also called "core needle biopsy"

Disease progression—Continued growth or spread of cancer

Echinoderm microtubule-associated protein-like 4 (EML4)—A gene that, when combined with the anaplastic lymphoma kinase (ALK) gene, produces an abnormal protein that leads to cancer cell growth

EGFR—See epidermal growth factor receptor

Endocrine gland—A gland (for example, the thyroid or the pituitary) that produces an endocrine secretion

Epidermal growth factor receptor (EGFR)—The protein found on the surface of some cells and to which epidermal growth factor binds, causing the cells to divide. It is found at abnormally high levels on the surface of many types of cancer cells, so these cells may divide excessively in the presence of epidermal growth factor

Fine needle aspiration (FNA)—The removal of tissue or fluid with a thin needle for examination under a microscope, usually to determine if cancer is present or what the cancer cell type is

First-line treatment or therapy—The first treatment given for a disease. It is often part of a standard set of treatments, such as surgery followed by chemotherapy and radiation. When used by itself, first-line therapy is the one accepted as the best treatment. If it doesn't cure the disease or it causes severe side effects, other treatment may be added or used instead

Genetic mutation—Any change in the gene sequence of a cell. Mutations may be caused by mistakes during cell division, or they may be caused by exposure to gene-damaging agents in the environment. Certain mutations may lead to cancer or other diseases

Hepatitis—Disease of the liver causing inflammation. Symptoms include an enlarged liver, fever, nausea, vomiting, abdominal pain, and dark urine

Immune checkpoint inhibitors—Agents that target the pathways tumor cells use to evade recognition and destruction by the immune system

Interventional radiologist—A medical doctor who is specially trained to use minimally invasive image-guided procedures to diagnose and treat diseases, with the goal of minimizing risk to the patient and improving health outcomes

Intravenous (IV)—Into or within a vein. Intravenous usually refers to a way of giving a drug or other substance through a needle or tube inserted into a vein. Also called IV

Large cell carcinoma—Lung cancer in which the cells are large and look abnormal when viewed under a microscope

Low-dose CT (LDCT) scan—A newer form of CT scan that uses less radiation than a standard chest CT and takes less than one minute to complete. It continuously rotates in a spiral motion and takes several three-dimensional, very detailed X-rays of the lungs. This type of CT uses no dyes and no injections, and requires nothing to swallow by mouth. Also known as "low-dose spiral [or helical] CT scan"

Lymph node, lymph gland—A rounded mass of lymphatic tissue surrounded by a capsule of connective tissue. Lymph nodes filter lymph, the clear fluid that carries cells to fight infections and other diseases, and store lymphocytes (white blood cells)

Maintenance therapy—Treatment that is given to help keep cancer from growing after it has shrunk or stabilized following initial therapy. It may include treatment with drugs, vaccines, or antibodies that kill cancer cells, and it may be given for a long time

Mediastinum—The space in the chest that is between the lungs. The organs in this area include the heart and its large blood vessels, the trachea, the esophagus, the thymus, and lymph nodes, but not the lungs

Metastasis—The spread of cancer from the primary site, or place where it started, to other places in the body

Metastatic—Having to do with metastasis

Molecular testing (biomarker, genetic, or mutation testing)— Analyzing DNA to look for a change in the DNA that may indicate an increased risk for developing a specific disease or disorder. Also known as "genetic testing," "biomarker testing," or "mutation testing"

Mutation—See genetic mutation

Neoadjuvant—Treatment given prior to the main treatment in order to shrink a tumor. Examples of neoadjuvant therapy include chemotherapy and/or radiation therapy prior to surgery

Nephritis—Acute or chronic inflammation of the kidney caused by infection, degenerative process, or vascular disease

Neutropenia—A condition in which there are fewer than normal neutrophils (a type of white blood cell), leading to increased susceptibility to infection

Nodule—A growth or lump that may be malignant (cancer) or benign

Non-small cell lung cancer (NSCLC)—A group of lung cancers that are named for the kinds of cells found in the cancer and how the cells look under a microscope. The three main types of non-small cell lung cancer are squamous cell carcinoma, large cell carcinoma, and adenocarcinoma. Non-small cell lung cancer is the most common kind of lung cancer

Oncologist—A doctor who specializes in treating cancer. Some oncologists specialize in a particular type of cancer or cancer treatment. For example, a thoracic oncologist specializes in treating lung, esophageal, pleural, mediastinal, and chest wall tumors. A radiation oncologist specializes in treating cancer with radiation

Pathologist—A doctor who identifies diseases by studying cells and tissues under a microscope or with other equipment

Pathology report—The description of cells and tissues made by a pathologist based on what is seen under a microscope. This is sometimes used to make a diagnosis of lung cancer or another disease. May also be referred to in short form as "path report" or even "the path"

PD-L1 (programmed death ligand 1)—Part of the immune system mechanism that keeps T cells from functioning

Periphery—The outermost part or region within a precise boundary

Phlegm—Thick mucus made by the cells lining the upper airways and lungs

Pleural effusion—Fluid around the lungs

Protein—A molecule made up of amino acids that is needed for the body to function properly. Proteins are the basis of body structures, such as skin and hair, and of other substances such as enzymes, cytokines, and antibodies

Pulmonologist—A doctor who specializes in lung disease

Second-line treatment or therapy—Treatment that is usually started after the first set of treatments doesn't work, has stopped working, or has side effects that are not tolerated

Small cell lung cancer (SCLC)—A fast-growing cancer that forms in tissues of the lung and can spread to other parts of the body. Named "small" for how the cancer cells look under a microscope

Sputum—Mucus and other matter brought up from the lungs by coughing

Squamous cell lung cancer—A type of non-small cell lung cancer that usually starts near a central bronchus. It begins in squamous cells, which are thin, flat cells that look like fish scales

Stereotactic body radiation therapy (SBRT)—A type of external radiation therapy that uses special equipment to position a patient and precisely deliver extremely high doses of radiation to the tumor while decreasing the dose to healthy tissue nearby. Instead of giving small doses of radiation each day for several weeks, SBRT can be given in two to five treatments

Stomatitis—Inflammation or irritation of the mucous membranes in the mouth

T cell, T lymphocyte—A type of white blood cell. T cells are part of the immune system and develop from stem cells in the bone marrow. They help protect the body from infection and may help fight cancer

Therapeutic cancer vaccine—A type of treatment, using a vaccine that is usually made from a patient's own tumor cells or from substances taken from tumor cells. A cancer vaccine may help the immune system kill cancer cells

Tracer—A substance used in imaging procedures so that certain structures can be identified or the substance can be followed

Trachea—The airway that leads from the larynx (voice box) to the bronchi (large airways that lead to the lungs). Also called “windpipe”

Tumor—An abnormal mass of tissue that results when cells divide more than they should or do not die when they should

Ultrasound—A procedure that uses high-energy sound waves to look at tissues and organs inside the body

Vascular endothelial growth factor (VEGF)—A protein made by cells that stimulates new blood vessel formation

VEGF—See vascular endothelial growth factor

X-ray—A type of radiation used in the diagnosis and treatment of cancer and other diseases. In low doses, X-rays are used to diagnose diseases by making pictures of the inside of the body. In high doses, X-rays are used to treat cancer

05 my healthcare team

Please use the space below to write down the contact information of the members of your healthcare team.

MEDICAL ONCOLOGIST _____

Contact Information _____

_____

_____

THORACIC SURGEON _____

Contact Information _____

_____

_____

RADIATION ONCOLOGIST _____

Contact Information _____

_____

_____

PULMONOLOGIST _____

Contact Information _____

_____

_____

PRIMARY CARE DOCTOR _____

Contact Information _____

_____

_____

ONCOLOGY NURSE _____

Contact Information _____

_____

_____

ONCOLOGY SOCIAL WORKER _____

Contact Information _____

_____

_____

COUNSELOR/THERAPIST _____

Contact Information _____

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_____

NUTRITIONIST/DIETITIAN _____

Contact Information _____

_____

_____

PHARMACIST

Pharmacy

Contact Information

OTHER TEAM MEMBERS

Name Specialty

Contact Information

Name Specialty

Contact Information

Name Specialty

Contact Information

06 notes

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