



LUNG HEALTH

It is important that we make lung health a priority.

Human beings breathe about 22,000 times and take in over 2,000 gallons of air per day. While lung issues can

seem scary—take a deep breath.

Lake Charles Memorial is here to help.

LUNGS

Lungs are a critical part of how our bodies function. Lungs take in oxygen through the air we breathe, and that oxygen is transmitted through our bloodstream to all the cells in our bodies. This oxygen is required for the cells to perform all the tasks needed to keep us alive and healthy.

The lungs are sponge-like organs in your chest. Their job is to bring oxygen into the body and to get rid of carbon dioxide. When you breathe air in, it goes into your lungs through your windpipe (trachea). The trachea divides into tubes called bronchi, which enter the lungs. These divide into smaller branches called bronchioles. At the end of the bronchioles are tiny air sacs called alveoli. The alveoli move oxygen from the air into your blood. They take carbon dioxide out of the blood. This leaves your body when you breathe out (exhale).

Your right lung is divided into 3 sections (lobes). Your left lung has 2 lobes.

LUNG DISEASES

Asthma

Asthma is a long-term disease of the airways of the lung. The airways become sensitive to triggers (allergens and irritants). With exposure to triggers, the following changes occur:

- The lining of the airways becomes swollen and inflamed
- The muscles that surround the airways tighten
- More mucus is produced, leading to mucus plugs

All of these factors cause the airways to narrow. This makes it hard for air to go in and out of the lungs.

Bronchitis

Bronchitis is an infection in bronchial tubes, or the tubes that carry air to your lungs, which causes them to get swollen. It causes a nagging cough and a higher level of mucus production. There are two types of bronchitis.

Acute bronchitis is the more common of the two. Symptoms last several weeks, but once it has cleared up, no further problems will occur.

Chronic bronchitis involves symptoms that continue to occur or never go away. This is one of the main diseases that contribute to chronic obstructive pulmonary disease, or COPD.

Emphysema

Emphysema is another type of chronic obstructive pulmonary disease, or COPD. Emphysema is a chronic lung disease in which the tiny air sacs in your lungs get irreparably damaged along their linings. Air pockets form inside the lungs and they get larger, making it more difficult to breathe.

Pulmonary Fibrosis

Pulmonary fibrosis is a disease whereby lung tissue becomes scarred and excess fibrous connective tissue is accumulated in the lungs. This in turn causes the walls of the lungs to thicken creating serious breathing problems, which affects the amount of oxygen absorbed into the bloodstream. The main symptom is shortness of breath, but other symptoms include chronic dry coughs, fatigue, chest pain and loss of appetite.

Pulmonary Hypertension

Pulmonary hypertension is a specific kind of high blood pressure that affects the arteries on the right side of your heart and in your lungs. Common symptoms include chest pain, fatigue and shortness of breath. While the condition cannot be cured outright, treatment can slow progression and improve symptoms.

LUNG CANCER

How can I be screened for lung cancer?

If you are a smoker or if you used to be a smoker, Memorial offers low-dose CT lung cancer screenings. If you meet the at-risk criteria, many insurance companies now cover this screening. A cash-price is also available if insurance does not cover your screening.

CT lung cancer screenings are very sensitive and allow for early detection of potential tumors and other abnormal growths in their early stages. In fact, the CT lung cancer screening can detect growths that are smaller than one centimeter. You'll need to obtain a physician referral from the Lake Charles Memorial Radiology Department or your personal physician.

Catching a tumor early increases your chance of successful treatment. But are you at risk? According to the American Cancer Society, you should consider scheduling a screening if the following factors identify you as high risk:

- Between the ages of 55 and 74
- You have a history of heavy smoking, which means 30 “pack years” or more-i.e., roughly one pack a day for 30 years, or the equivalent, such as two packs a day for 15 years
- You are a current smoker or you quit smoking less than 15 years ago

You should also have a screening if this set of factors applies to you:

- You are age 50 or over
- You have a history of smoking 20 “pack years”-i.e., roughly one pack a day for 20 years, or the equivalent, such as two packs a day for 10 years
- You have another risk factor such as high exposure to radon; exposure to airborne carcinogens; former diagnosis of a cancer related to smoking; or a family history of cancer

The best way to determine whether or not you should be screened for lung cancer is to speak with your doctor. Tell your doctor about your risk factors, including high exposure to cancer-causing substances such as arsenic, cadmium, soot, coal smoke, silica, beryllium, nickel, diesel fumes, asbestos, arsenic, and chromium.

What are the types of lung cancer?

Lung cancer is divided into two main types: non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC). These types grow and spread differently. They are often treated in different ways.

Non-small cell lung cancer (NSCLC)

About 85% to 90% of lung cancers are non-small cell. This cancer has 3 types. They are grouped by the kind of lung cell the cancer started in and by how the cells look under a microscope. They have slight differences among them. But they tend to have a similar outlook (prognosis) and are generally treated the same way:

- **Adenocarcinoma.** This is the most common type of NSCLC, but it’s found more often in smokers or former smokers. It tends to grow in the outer edges of the lungs. It usually grows more slowly than other types of lung cancer.
- **Squamous cell carcinoma (epidermoid carcinoma).** This type of NSCLC develops more often in smokers or former smokers. These cancers tend to start in the middle part of the lungs near the main airways (the bronchi).
- **Large cell carcinoma.** This is the least common type of NSCLC. It tends to quickly grow and spread to other organs. This can make it harder to treat.

Small cell lung cancer (SCLC)

Only about 10% to 15% of people with lung cancer have small cell lung cancer. It is also called oat cell cancer. It grows and spreads more quickly than non-small cell lung cancer. It often spreads to other parts of the body at an early stage.

How lung cancer spreads

Lung cancer, like all cancers, can act differently in each person, depending on the kind of lung cancer it is and the stage it is in. But when lung cancer spreads outside the lungs, it often goes to the same places.

The first place lung cancer usually spreads to is the lymph nodes in the center of the chest. These lymph nodes are called mediastinal lymph nodes. Lung cancer may also spread to the lymph nodes in the lower neck. In its later stages, lung cancer may spread (metastasize) to distant parts of the body, like the liver, brain, or bones.

What does stage of a cancer mean?

The stage of a cancer is how much and how far the cancer has spread in your body. Your healthcare provider uses exams and tests to find out the size of the cancer and where it is. He or she can also see if the cancer has grown into nearby areas, and if it has spread to other parts of your body. The stage of a cancer is one of the most important things to know when deciding how to treat the cancer.

What are the stages of lung cancer?

The stage of non-small cell lung cancer (NSCLC) is based on these things:

- Size and extent of your tumor
- Whether lymph nodes are involved and, if so, how many
- Whether the cancer has spread to other parts of your body

The stages of NSCLC are described using the TNM staging system.

The TNM system

The TNM system is a standard system for describing how much a cancer has spread. Here’s what the letters stand for in the TNM system:

- **T** tells how large a **tumor** is and whether it has grown into nearby structures
- **N** tells whether the **lymph nodes** near the tumor are cancerous
- **M** tells whether the cancer has spread (**metastasized**) to other organs in the body, such as your brain, bones, or liver

Numbers are assigned to each of the T, N, and M categories. Once your doctor has determined your T, N, and M categories, he or she uses this information in a process called stage grouping. Stage grouping is used to find out your overall disease stage.

Stage groupings

These are the stages of non-small cell lung cancer. Each TNM category has a number value from X to 4. It falls into one of these stages:

- **Occult.** This means you have cancer cells in your sputum (mucus from the lungs) or other lung fluids. At this stage, the tumor in your lungs cannot be seen. You may hear your doctor use these TNM terms for this stage: TX, N0, M0
- **Stage 0.** In this stage, cancer is only in the cells lining your air passages. The cancer is very tiny. It has not invaded deeper into lung tissues or spread outside the lungs. Cancer at this stage is also called carcinoma in situ. You may hear your doctor use these TNM terms for this stage: Tis, N0, M0
- **Stage I.** In this stage, you have cancer in your lung, and it may affect your airways (bronchi) or the lining outside your lung. Cancer found at this stage usually offers a good chance of survival. Stage I is divided into Stage IA and IB, based on the size and location of the tumor. For Stage IA, your doctor may use these TNM terms: T1, N0, M0. For Stage IB, your doctor may use these TNM terms: T2a, N0, M0
- **Stage II.** In this stage, the cancer may have spread into surrounding tissue. You may have cancer in your lymph nodes within your lung on the same side the cancer is in. Stage II is divided into Stage IIA and IIB, based on the size and location of the tumor and whether it has spread to the lymph nodes. For Stage IIA, your doctor may use these TNM terms: T1, N1, M0 or T2a, N1, M0 or T2b, N0, M0. For Stage IIB, your doctor may use these TNM terms: T2b, N1, M0 or T3, N0, M0
- **Stage III.** Stage III is divided into two substages: Stage IIIA and Stage IIIB. In Stage IIIA, the cancer may have spread to the organs or lymph nodes in the middle of the chest (mediastinum). Or it may have spread into a different lobe in the same lung. It may also have spread to lymph nodes behind your windpipe (trachea). For Stage IIIA, you may hear your doctor use these TNM terms: T1-T3, N2, M0 or T3, N1, M0 or T4, N0-N1, M0. In Stage IIIB, the cancer has spread to the lymph nodes above your collarbone on either side or to the lymph nodes on the other side of your chest. Or it has grown into the middle part of the chest or into a different lobe of the same lung, as well as into lymph nodes in the middle of the chest. For Stage IIIB, you may hear your doctor use these TNM terms: Any T, N3, M0 or T4, N2, M0
- **Stage IV.** In Stage IV, the cancer has spread to the other lung, into the fluid around the lung or heart, or to other distant organs in your body such as the liver or brain. You may hear your doctor use these TNM terms for this stage: Any T, any N, M1a-M1b

Limited vs Extensive Stage

For practical purposes, doctors usually prefer to divide small cell lung cancer (SCLC) into just two stages. They are based on whether you may be helped by local treatments such as radiation therapy. Here are the two stages:

- **Limited.** In this stage, you have cancer only in one lung. You may also have cancer in nearby lymph nodes. But all of the cancer can be reached with a single radiation field
- **Extensive.** If you have extensive stage cancer, the cancer has spread too far to be treated with one radiation field. It may have spread to the other lung, to lymph nodes on the other side of the chest, or to distant parts of the body

What if it is lung cancer?

When it comes to being diagnosed with lung cancer, every patient is different. One may put up a stoic front. One may be very emotional. Another may want to know every fact and detail about the lung cancer process. Another may be overwhelmed with work, family, and other responsibilities. Should you choose Lake Charles Memorial's Cancer Center for treatment, you will be guided and supported every step of the way, from diagnostics to therapy to postoperative care and emotional support.

Who will help me through the treatment process?

Memorial's Cancer Conference team meets weekly to discuss the diagnosis, staging and treatment plan for our newly diagnosed cancer patients. This team includes physicians from the specialities of surgery, pathology, radiology, medical oncology and radiation oncology as well as primary care physicians. Allied healthcare professionals such as nurse practitioners, nurses, social workers and oncology data managers also participate in this conference. This ensures that the entire team has the diagnosis and staging information, action plan and support needed to make decisions and take the next steps.

Our professionals will provide unhurried consultations and take the time to explain processes and treatment options—and discuss potential advantages and disadvantages of therapies—so you can make the most informed treatment choice.

What types of diagnostics are available?

After a diagnosis of lung cancer, you will likely have other tests. These tests help your healthcare providers learn more about your cancer.

Biopsy or surgery samples

Lung cancer is usually diagnosed by removing a sample of a tumor during a biopsy. If non-small cell lung cancer (NSCLC) is diagnosed, special lab tests may be done on the biopsy samples to see if the cancer cells have certain gene changes. These tests can help show whether certain types of cancer medicines are likely to work to treat the cancer.

Imaging tests

- **CT scan** - During a CT scan X-rays are used to scan a part of the body such as the chest or abdomen to create detailed pictures. When you have lung cancer, these pictures help your doctor see where the cancer is in your chest. They also show if the cancer has spread to nearby lymph nodes or to other organs
- **MRI** - An MRI uses magnets, radio waves, and a computer to create detailed pictures of the inside of your body. An MRI may be used to find out if cancer has spread. If it has, an MRI can also show the size of it and how far it has spread. In some cases, you are injected with a contrast dye before getting the scan
- **PET scan** - A PET scan can give the doctor a better idea of whether an abnormal area seen on a CT scan or other imaging test is a tumor. A PET scan can determine if or where the cancer has spread. Because the PET scans your whole body, your doctor may order this scan instead of ordering multiple X-rays of different places on your body. The picture is not as detailed as a CT scan, but it can be used along with a CT scan to look for tumors
- **Bone scan** - A bone scan is similar to a PET scan, but it uses a different radioactive substance that marks changes in bones. The bones may change because the cancer has spread there. This test is done mainly to determine if the cancer has spread to the bones

Procedures to look for cancer spread

- **Transbronchial needle aspiration, endobronchial or esophageal ultrasound** - These tests can be used to look for cancer that has spread to lymph nodes or other problems in the area between the lungs (mediastinum).

For an endobronchial ultrasound, a bronchoscope is fitted with an ultrasound transducer at its tip and is passed down into the windpipe. This allows the pulmonologist to look at lymph nodes and other structures in the lungs.

If the doctor sees suspicious areas such as enlarged lymph nodes, he or she will use a transbronchial needle aspiration and pass a hollow needle through the bronchoscope to get biopsy samples of them.

A similar test, known as endoscopic esophageal ultrasound, can also be used to look at lymph nodes in the lungs. But for this test, an endoscope is passed down the esophagus instead of the windpipe.

- **Mediastinoscopy or mediastinotomy** - These tests can also be used to look at the lymph nodes between the lungs. Although an imaging test such as a CT scan may show if you have enlarged lymph nodes, the doctor needs to find out if they have cancer in them.

These tests are done by a surgeon. Your doctor may make a small cut in the front of your neck for a mediastinoscopy. Less often, your doctor may make a small cut in your chest between your ribs for a mediastinotomy. This lets him or her see different sets of lymph nodes. The doctor then uses a lighted scope with a small video camera on the end to look at the center of your chest and the lymph nodes there. The doctor can also use special instruments passed down the scope to remove some tissue. The cells removed from the lymph nodes are sent to the lab to be checked for cancer.

- **Bone marrow biopsy** - This test is not used nearly as often as some of the others. But you may need it if you have small cell lung cancer (SCLC) and the doctor wants to see if the cancer has spread to the bone marrow.

What are my treatment options?

Different combinations of treatment may be used. Each treatment has its own goals.

- **Surgery.** If you have non-small cell lung cancer (NSCLC) that has not spread, surgery is often the first choice for treatment. It is often followed by other treatments. Surgery is used for only a small number of people with very early stage small cell lung cancer (SCLC). Occasionally, surgery may be considered after radiation or chemotherapy in people who have responded well with a decrease in tumor size
- **Radiation therapy.** Radiation therapy uses high-precision radiation to destroy cancer cells. It is often an option when you have an early stage tumor, but are not a candidate for surgery. It can also be used for more advanced cancers. It may be used by itself or with chemotherapy. Radiation therapy can also be used to help relieve symptoms from cancer that has spread. While there is only one type of radiation, there are several different ways it is delivered.
 - **3-D radiation.** 3-D radiation allows for radiation to be delivered more specifically to tumors. It shapes the beam to have the best impact and takes into account the tissue and organs surrounding the tumor
 - **Intensity-modulated radiation therapy (IMRT).** IMRT uses computer-controlled linear accelerators to attack the tumor specifically, and minimizes the amount of normal non-cancerous tissue exposed to radiation
 - **Image-guided radiation therapy (IGRT).** IGRT uses a combination of different scans and imaging techniques to determine the exact location of the tumor and make sure the radiation is delivered to the correct location

- **Volumetric arc therapy (VMAT).** VMAT is a more sophisticated form of IMRT that delivers a precisely-sculpted 3D radiation dose that attacks the tumor from 360 degrees
- **Vision RT- Align RT** is a highly technical system that tracks a patient's position before and during radiation treatment. Align RT can automatically signal for the treatment delivery system to pause radiation if the patient moves out of the desired position. Align RT allows radiation to have the biggest impact on tumors while protecting the heart from sustaining any radiation damage. It takes scans of your body while you inhale and exhale and stops the beams of radiation when your breathing moves your body from the correct position, protecting your heart
- **Chemotherapy.** Chemotherapy is the use of anticancer medicines. It is usually part of the treatment for SCLC, as well as for more advanced stages of NSCLC
 - **Targeted therapy.** This type of treatment uses medicines that zero in on the specific changes in cancer cells or in nearby tissues that cause the cancer to grow and spread. Several targeted medicines can be used to treat some advanced NSCLCs, either alone or along with chemotherapy
 - **Immunotherapy.** Immunotherapy uses medicines to boost your own immune system to attack the cancer cells. Medicines called immune checkpoint inhibitors can be used to treat advanced NSCLC
- **Photodynamic therapy (PDT).** For PDT, a light-sensitive medicine is injected into the body. Then a special light on the end of a bronchoscope is aimed at the cancer cells, killing them. This treatment can be used to reduce symptoms of lung cancer, such as trouble breathing. It may also be used to treat very small tumors in people who cannot have the usual treatments
- **Radiofrequency ablation (RFA).** RFA can be used to treat some small tumors near the outside of the lungs, especially in people who can't or don't want to have surgery. A metal probe is passed through the chest wall and into the tumor. High-energy radio waves are used to heat and destroy the tumor
- **Supportive care.** Your healthcare provider may advise therapies that help ease your symptoms, but don't treat the cancer. These can sometimes be used along with other treatments. Or your healthcare provider may suggest supportive care if he or she believes that available treatments are more likely to do you more harm than good

Clinical trials for new treatments

Researchers are always looking for new ways to treat lung cancer. These new methods are tested in clinical trials. Talk with your doctor to find out if there are any clinical trials you should consider.

What happens once treatment is finished?

After treatment for cancer ends, your healthcare team will develop a follow-up care plan which may include regular physical examinations and medical tests to monitor your recovery for the coming months and years. It will also involve managing any ongoing or late effects of treatment. It is also very important for you to keep an eye out for signs that the cancer may be recurring:

- Pain that is long lasting and not relieved by over-the-counter medication
- Bone pain or fractures
- Headaches or seizures
- Chronic coughing or trouble breathing
- Abdominal pain or jaundice (yellow skin or eyes)
- Extreme fatigue
- Feeling ill or generally unwell

Remember, worrying about cancer coming back is normal, especially during the first year after treatment. And even many years after treatment, this fear may still be in the back of your mind. As time goes by, many people say that their fear of cancer returning decreases and they find themselves thinking less often about cancer.

For others, the cancer may never go away completely. You may get regular treatments with chemotherapy, radiation therapy, or other treatments to try to help keep the cancer in check.

Learning to live with cancer can be difficult and very stressful. Your new "normal" may include making changes in the way you eat, the things you do, and your sources of support. It may mean fitting cancer treatments into your work and vacation schedule. It will mean making treatment part of your everyday life. Living with cancer is not so much about "getting back to normal" as it is learning what's normal for you now.



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