

Non-Small Cell Lung Cancer and Brain Metastasis



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ABOUT GO2 FOUNDATION

Founded by patients and survivors, GO2 Foundation for Lung Cancer transforms survivorship as the world's leading organization dedicated to saving, extending, and improving the lives of those vulnerable, at risk, and diagnosed with lung cancer.

GO2 Foundation works to change the reality of living with lung cancer by ending stigma, increasing public and private research funding and ensuring access to care.



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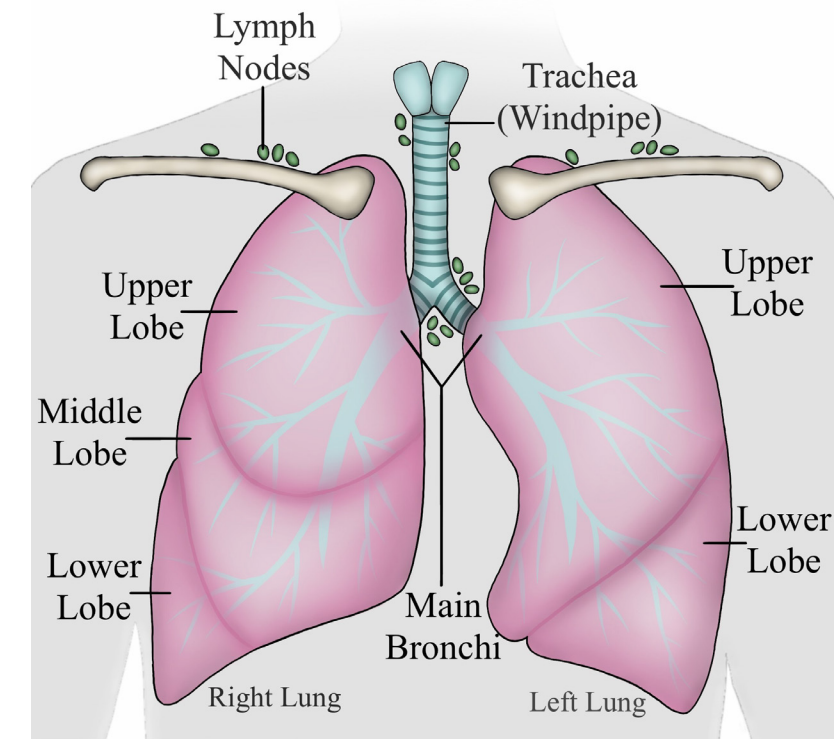


The brain can be affected by non-small cell lung cancer (NSCLC) if cancer cells from the lungs travel to brain and begin to grow. This is called brain metastasis and it is common in many types of cancer, including lung cancer.

This brochure was created to help you understand brain metastasis and how it is managed. The information can help you better understand your treatment choices and know what questions to ask your healthcare team.

Many have found the support of family, friends and social or faith groups can be helpful in coping with lung cancer. If you would also like to connect with other people with lung cancer, we can help.

To learn more about support groups or GO2 Foundation for Lung Cancer's Phone Buddy program, call us at 800-298-2435 or email support@go2foundation.org.



Lung cancer is one of the most common cancers in the United States. There are two main types of lung cancer, non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC). NSCLC is the most common type.

NSCLC is divided into four stages (1, 2, 3, and 4). Each of the four stages are further broken down into sub-stages using letters (A, B, C). The stage of the cancer is determined by its size and location. If cancer has spread to the brain, it is stage 4 lung cancer.

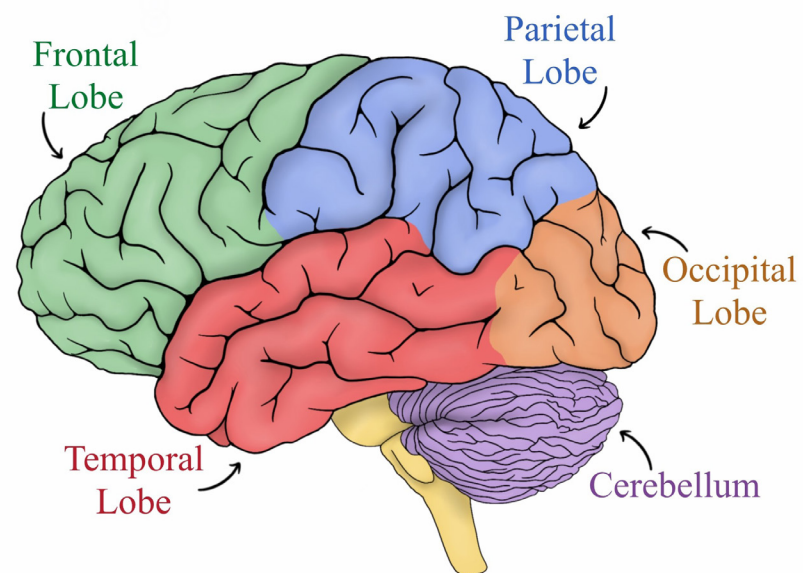
It is very important to know your stage because it guides how the cancer will be treated.

If you would like to learn more about NSCLC, please visit go2foundation.org/nsclc.

The Brain

The human brain is an amazing organ. Our brain allows us to think, talk, move, feel, and remember. Knowing a little bit about the brain and how it works can help you understand the possible effects of brain metastasis.

The brain is divided into sections that each have their own job. If lung cancer spreads into the brain, it can change how that part of the brain works.



The **frontal lobe** allows us to talk. It also controls our emotions and things such as intelligence, reasoning, behavior, memory, sexual urges, and personality.

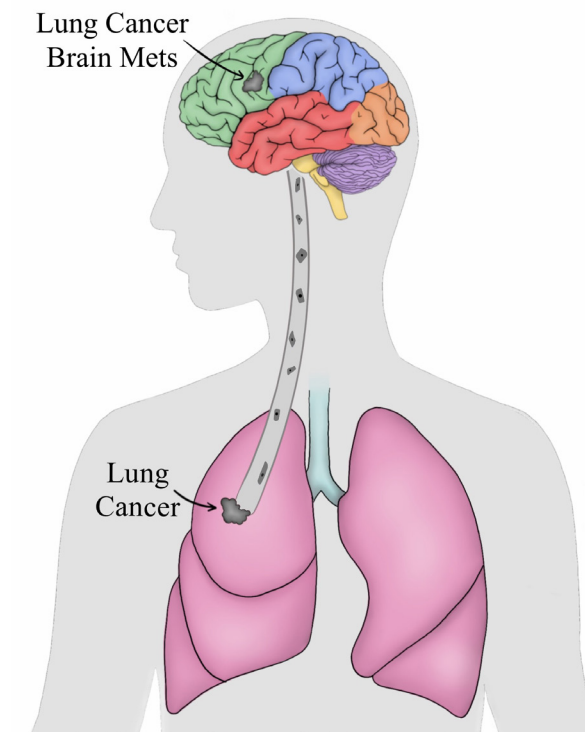
The **parietal lobe** processes our body's senses.

The **temporal lobe** helps with our memory, speech, and hearing.

The **occipital lobe** allows us to understand what we see.

The **cerebellum** makes sure that our muscles work together so that we can walk and stand.

Brain Metastases (Brain Mets)



The brain can be affected by non-small cell lung cancer if cancer cells from the lungs travel through the body to the brain and begin to grow. This is called brain metastasis or brain mets. This is not brain cancer. It is lung cancer that has spread to the brain.

NSCLC brain mets may appear long after lung cancer has been diagnosed. Other times, it is found at the same time as lung cancer. Sometimes people notice symptoms from brain mets before they have symptoms from lung cancer. After lung cancer is diagnosed, you will have regular scans to look for mets and in its earliest stage.

Lung cancer can spread to the bone, including to the skull. Mets to the skull are bone mets and not the same as when the cancer spreads to the brain.



Some symptoms caused by brain mets can be very general like a headache, memory problems or feeling very tired. Others can be very specific and are caused by pressure or irritation to a certain part of the brain. The symptoms of brain mets will match the part of the brain where the cancer is located.

Common symptoms of brain mets include:

- Speech problems (such as finding words)
- Muscle weakness
- Eye problems or trouble reading
- Pain, numbness, or paralysis
- Seizures
- Problems with body movements
- Nausea and/or vomiting
- Fatigue (a feeling of being tired that does not go away with enough rest or sleep)
- Memory problems
- Headaches

You will have regular scans to see how NSCLC treatment is working. These scans can also see if your cancer has spread to other parts of your body, including the brain. If the scan shows that lung cancer has spread to the brain, brain mets is diagnosed.

Always tell your healthcare team if you are having any symptoms affecting a new part of the body or body function.

This information allows your team to decide if an immediate scan is needed to look for mets to the brain or other areas of the body.

Examples of doctors who may be a part of your healthcare team and who diagnose and/or treat brain mets include:

- Medical oncologist: A cancer doctor who uses medicine (like chemotherapy) to treat cancer
- Radiation oncologist: A cancer doctor who uses radiation (high energy beams) to treat cancer.
- Neurologist: A brain doctor
- Neuro-oncologist: A brain cancer doctor
- Neuropathologist: A doctor that studies tissue from the brain
- Neuroradiologist: A doctor who uses imaging tests to understand the brain
- Neurosurgeon: A doctor who performs brain surgery



One type of scan that is often used to get a clear view of the brain is **magnetic resonance imaging (MRI)**.

An MRI uses very strong magnets to take pictures of the brain. Most brain MRIs are done with contrast.

Contrast is given through an IV (a tube put into a vein) to make the parts of the brain easier to see.

It is important to let your healthcare team know if you have any allergies or drug reactions before your scan.

Because MRIs use a magnet, you cannot bring certain things into the room, including jewelry and credit cards.

You will be asked if you have any metal in your body and if you are currently pregnant or could be pregnant. You should also let your healthcare team know if you are claustrophobic or have a fear of being in a tight space. There may be ways they can help make the scan easier for you. If you cannot have a brain MRI, a CT scan may be used instead.

After your MRI, a member of your healthcare team will contact you with the results and may talk to you about treatment options.

Radiation therapy is often used in the treatment of brain mets. It uses high energy beams to kill or shrink cancer cells. The beams may be aimed at certain spot(s) in the brain or the whole brain may receive radiation.

Types of radiation therapy:

■ **Whole brain radiation (WBR) or whole brain radiotherapy (WBRT)**

may be needed if there are many tumors in the brain. It works by delivering a low dose of radiation to the whole brain and can treat small amounts of cancer that cannot be seen on imaging tests.

■ **Stereotactic radiosurgery or SRS** (may also be called stereotactic radiotherapy or SRT) does not involve actual surgery with a knife. It treats one small part of the brain with a very high dose of radiation using many small radiation beams.

- During SRS, a head frame is used to keep your head very still. This allows the beams of radiation to enter the tumor from many different angles. It is very precise and helps to protect the healthy brain tissue near the tumor. SRS may be given as a single treatment or over a few sessions.

Targeted therapy is a type of cancer treatment used to treat NSCLC. It works differently than chemotherapy because it attacks a certain target on cancer cells. This means it can stop cancer cells without hurting normal healthy cells. Some targeted therapies may be able to cross the blood-brain barrier and help treat brain mets.

- **Biomarker testing** lets your healthcare team know if you have a cancer target that can be treated with targeted therapy. All people diagnosed with NSCLC should have biomarker testing. Be sure to ask your healthcare team if you have received biomarker testing and whether you are a candidate for targeted therapy.

Surgery to remove the cancer may be considered in some cases when there are less than three spots in the brain. Surgery to the brain is done through a procedure called a craniotomy.

During a **craniotomy**, the surgeon will make an opening in the skull to reach the brain. Treatments with whole brain radiation is often used after surgery. Talk with your healthcare team about whether surgery is an option for you. It is important to understand the risks and benefits of surgery.



Immunotherapy may be used to treat NSCLC and may cross the blood-brain barrier to treat brain mets. Ask your healthcare team if immunotherapy is an option for you.

Chemotherapy can have trouble getting through the blood-brain barrier and is not typically used to treat brain mets.

The type of treatment needed for mets in the brain may be different than the treatment you are currently receiving for NSCLC in other parts of your body. This is because the brain has an extra layer of protection, and some treatments cannot get through this barrier to fight the cancer.

This barrier is known as the **“blood-brain barrier.”** Its job is to stop harmful substances from reaching the brain while letting helpful ones into the brain. Unfortunately, lung cancer can pass through this barrier. Some cancer treatments can get through the barrier and attack cancer in the brain, but others cannot.

Current research is focused on developing more treatments that can get through the blood-brain barrier. Your healthcare team will look carefully for the treatment options that are right for you.

Treatment decisions for brain mets are based on:

- The kind of lung cancer you have
- When brain mets are found
 - Whether it is before or after lung cancer is diagnosed
 - Whether you are in treatment or after lung cancer treatment has ended
- How many and where the mets are in your brain
- Your overall health and your personal goals of treatment

To learn more about these NSCLC treatments, please see go2foundation.org/education.



Always ask your healthcare team any questions you have about your treatment. Here are a few questions you may want to ask.

- What are my treatment options?
- What type of treatment do you recommend for me and why?
- What are the risks and benefits of the treatment options?
- What are the possible side effects from my treatments and how can I manage them?
- When do I start treatment? How long will it last? How often will I get it?
- Are there any clinical trials that are appropriate for me? If so, how do I get more information?



A clinical trial is a research study to determine whether a new drug, combination of drugs, procedure or medical device is safe and effective. Sometimes clinical trials explore different ways of using treatments to make them more effective, easier to use and/or decrease side effects. Clinical trials may also help doctors learn how to best use a treatment in a specific group of people.

Clinical trials are an option for people diagnosed with NSCLC and should be considered every time a treatment decision is made.



Palliative care is a supportive service that can help improve your quality of life. It is provided by a healthcare team member who has special training in managing the symptoms and side effects of cancer. It is important that you find some relief from the effects of cancer and treatment. Ask your healthcare team about how to find palliative care.

There are other members of the healthcare team who can offer support or improve certain skills that may have been affected by cancer or cancer treatment. These include:

- Neuropsychologist: A mental health doctor that helps with the brain, behavior and thinking skills.
- Occupational therapist: A highly- trained healthcare team member who helps people increase independence in daily tasks.
- Physical therapist: A highly trained healthcare team member who helps the body move and recover after injury or disease.
- Speech therapist: A highly trained healthcare team member who helps people improve speech and swallowing skills.
- Social worker: A highly trained healthcare team member who provides counseling and helps people find resources to meet their needs.

For more information about lung cancer, support options and other available resources, please visit go2foundation.org; call our HelpLine at 800-298-2436 or email support@go2foundation.org.

To learn more about clinical trials, visit LungMATCH.org or call 800-298-2436 and ask to speak with a Clinical Trial Navigator.



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