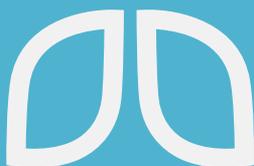


UNDERSTANDING

LUNG NODULES

A GUIDE FOR THE PATIENT



LUNG CANCER ALLIANCE

1-800-298-2436

LungCancerAlliance.org

WHAT IS A NODULE?

Lung nodules are abnormal spots, round in shape that may show up on your lung cancer screening scan or other imaging test. Doctors may call them lesions, coin lesions, growths or solitary pulmonary nodules. Lung nodules are very common.

At least **50%** of people have nodules by the time they are 50 years old.



All lung cancer initially appears as a nodule but **95%** of lung nodules are **NOT** cancer.

The challenge is figuring out which nodules are or will become cancer. Nodules that are not cancer may be the result of a bacterial or fungal infection in the past or a non-infectious condition like rheumatoid arthritis or sarcoidosis that causes inflammation and scarring in the lungs.

A nodule may also be found accidentally through an imaging test for something else, for example during a scan before surgery, after an injury or to explore another health condition like heart disease or Chronic Obstructive Pulmonary Disorder (COPD). This is called an "incidental finding."

NODULES FOUND BY SCREENING

Screening is a process that looks for disease in a person who is at risk for the disease but has no symptoms. In lung cancer, screening is recommended yearly for people at high risk. It is done to find disease as early as possible. With cancer, especially lung cancer, the earlier it is found, the better chance there is for a cure. Lung cancer screening uses an imaging scan called low-dose computed tomography (LDCT), which is a specific type of CT scan.

A CT scan takes a 3-dimensional image of your lungs and identifies abnormalities that could be cancer. The scan can show nodules as small as a grain of rice.

Even if no nodules are found, yearly scans are suggested for those at high risk because lung cancer can still develop over time. You may have a yearly scan that remains clear every year it is performed. If a nodule shows up on one of the annual screens, it may be watched even more closely to determine if it is cancer.

IT'S NOT ALWAYS CANCER

Imaging scans can show changes in the lungs that are not always cancer. Sometimes it is hard to tell the difference between nodules that are cancer (malignant) and those that are not (benign). Repeat scans may be needed to see if they are growing. Growth is a sign of cancer. In addition, the larger the nodule is, the more likely it is to be cancer. It is common to need another scan soon after the nodule is identified if the nodule is large to determine how much it changes over time.

When a nodule is found, whether through screening or not, your doctor may want to learn more. What happens next depends on what the nodule looks like.

NODULE FEATURES

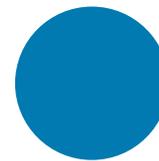
There are four basic features your doctor will look at when a nodule is found. These features can help your doctor decide the next step to take.

DENSITY

Objects in a picture from a CT scan range in color from white to black depending on their density. Dense objects such as bone appear as white and non-dense objects such as air in the lungs appear black and other objects such as muscle appear grey. A nodule has a range of densities depending on what it is made of. Regardless of whether a nodule is benign or malignant, it appears grey. Some nodules contain deposits of calcium, which makes them look like bone. These calcified nodules are less likely to be cancer.

MARGIN

The margin is the place where the nodule is in contact with normal lung tissue. The margins of many cancers are uneven, look spiky and are described as "spiculated." Most nodules that are not cancer have very smooth or rounded margins or look like several rounded nodules together (also called "lobulated").



SMOOTH



LOBULATED



SPICULATED

SIZE

Most benign (not cancerous) nodules are small in size. If you have a nodule and you are at high risk for lung cancer, you may be asked to come back in a year or sooner for another imaging test just to make sure it hasn't changed. Smaller nodules are usually followed by additional CT scans while larger nodules require further evaluation in addition to imaging tests, such as biopsy (see page 10). Nodules less than eight millimeters (mm) are often difficult to biopsy.

There is no specific size cutoff for small or large. In general, any nodule that is less than 10 mm is considered small. Once a nodule gets to be bigger than 3 centimeters (cm) it is called a mass. But when it comes to nodules, it's not just the size that matters. Follow up recommendations depend on whether the person with the nodule is at high risk or low risk for lung cancer, the density of the nodule and if the nodule is new or was there on an earlier test.

•
1mm

●
5mm

●
10mm / 1cm

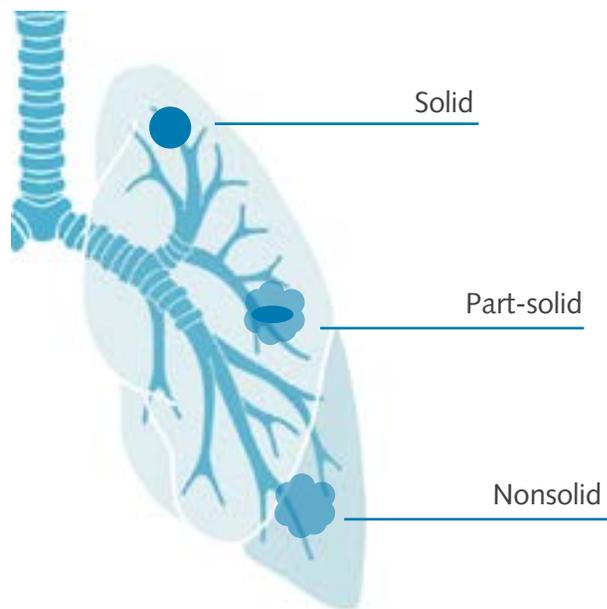
●
15mm / 1.5cm

●
20mm / 2cm

mm = millimeters, cm = centimeters

CONSISTENCY

When looking at a CT scan, nodules can look very different. They can look solid or they can look hazy or somewhere in between. When the nodule appears solid, it is called exactly that; a solid nodule. If it appears hazy with no solid parts, it is called a nonsolid nodule or a ground glass nodule (GGN) because it looks like ground glass. Unlike a solid nodule, you can see through it but it is still visible on the CT scan because it is denser than the rest of the lung. In some cases, a nodule may have a solid part of it with a hazy part around it. These are called part-solid or semi-solid nodules. Nodules of all types may or may not be cancer but consistency can help your doctor decide how to follow up.



WHAT NEXT?

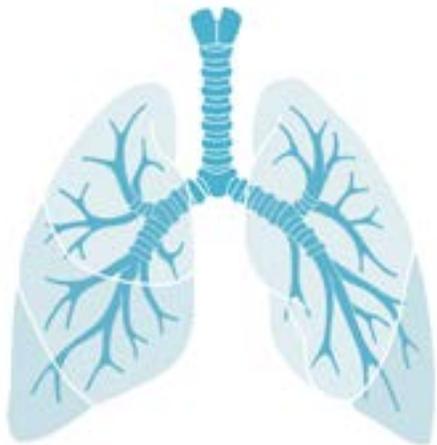
Nodules that are large, look suspicious or have changed over time will need further evaluation such as additional imaging tests or a biopsy.

- ▶ **CT** uses x-rays to produce cross-sectional images inside the body. It provides more information and is more sensitive than a regular x-ray.
- ▶ **PET** shows how cells use glucose (also known as sugar). Since cancer cells usually use more glucose than the cells around it, they appear as “hot spots” (bright areas) on the scan.
- ▶ **PET/CT** allows both types of scans to be done at the same time and can provide more information than either test alone.
- ▶ **BIOPSY** is a procedure done to see if the nodule in question is cancer. During a biopsy, small pieces of the nodule are removed from the body and examined under a microscope by a doctor called a pathologist. If the biopsy indicates there is cancer present, it also identifies the type of cancer. If it is lung cancer, the biopsy sample should show the type of lung cancer. There are a number of ways that tissue can be removed for biopsy. The type of procedure is determined by the size of the nodule, where it is located in the lung and your overall health. For more information please see the Lung Cancer Alliance brochure, *Understanding Lung Cancer Biopsies*.

QUESTIONS TO ASK ABOUT YOUR RESULTS

What was found? _____

Where is it? Where are they located? (Label on diagram)



What can you tell about the nodule(s) from my scan?
 (Use below grid)

	Size	Margin	Density	Consistency
Nodule 1				
Nodule 2				
Nodule 3				

Additional findings: _____

What follow up do you recommend and why?

WHERE CAN I GO FOR MORE INFORMATION?

For more information about lung cancer, treatments and clinical trials, to discuss support options or for referral to other resources, please contact us.

HELPLINE | 1-800-298-2436

**CLINICAL TRIAL
MATCHING SERVICE** | lungcanceralliance.org/clinicaltrials

WEBSITE | lungcanceralliance.org

E-MAIL | support@lungcanceralliance.org

MAIL | 1700 K Street, Suite 660, Washington, DC 20006

WHAT WE DO

- Offer personalized support, information and referral services at no cost through a team of trained, dedicated staff members to help patients, their loved ones and those at risk.
- Advocate for increased lung cancer research funding and equitable access, coverage and reimbursement for screening, treatment, diagnostics and testing.
- Conduct nationwide education campaigns about the disease, risk and early detection.



LUNG CANCER ALLIANCE

SAVING LIVES AND ADVANCING RESEARCH
BY EMPOWERING THOSE LIVING WITH AND
AT RISK FOR LUNG CANCER



LUNG CANCER ALLIANCE

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