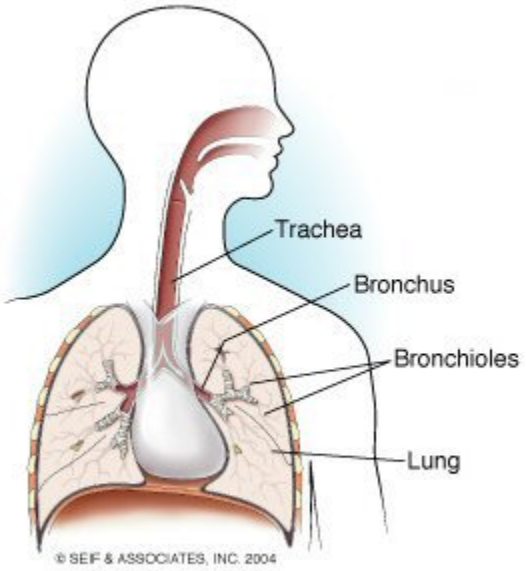
Pulmonary Nodule

A pulmonary (lung) nodule is small, round growth in the lung. A nodule is about 3 centimeters (about an 1 inch) or less in size. A pulmonary nodule may be found when a chest X-ray is performed for another reason. A nodule can be classified as not cancerous (*benign*), cancerous (*malignant*) or an abnormal growth:

Benign nodules. More than half of all pulmonary nodules are not cancerous. Benign nodules can be caused from things like:



- Bacterial infection. This is an infection caused by germs (*bacteria*).
- Fungal infection. This is an infection caused by a fungus (another type of germ).
- Viral infection. Viruses are tiny organisms that carry disease.
- Some diseases can lead to benign nodules such as:
  - Rheumatoid arthritis. This disease causes joint pain and swelling.
  - Wegener's granulomatosis. This disease causes inflammation of small blood vessels. Pulmonary nodules also may result.
  - Sarcoidosis. This disease can cause abnormal growths in the body, including the lungs.

Malignant nodules. These are cancerous growths.

- Certain things can cause a cancerous nodule. They include:
  - Age. As people get older, cancerous nodules may be more likely to occur.
  - Cancer history. If you or one of your immediate family members has had cancer, a cancerous nodule may be more likely.
  - Smoking. This can include both former and current smokers.

Abnormal growths:

- Abnormal growths can cause a pulmonary nodule. These can be either benign or malignant. Examples of abnormal growths include:
  - *Hamartoma*. This growth is made of many different types of tissues, such as fat, muscle, fiber and a tough, elastic tissue called cartilage.
  - *Bronchial adenoma*. This is a growth in the windpipe (*trachea*) or the airways in the lung (*bronchi*).
  - *Chondroma*. This is a growth of cartilage tissue.
  - *Fibroma*. This is a growth of fibrous (fiber-like) tissue.
  - *Lipoma*. A lipoma is soft, fatty tissue.

DIAGNOSIS

When a nodule is found, the next step is to find out if it is cancerous or non-cancerous. Your caregiver will ask about you and your family's health history. Tests will be done to help determine the type of nodule that you have. Diagnostic tests may include:

- **Imaging tests**. A pulmonary nodule is usually found on an imaging test. These take pictures of your lungs. Types of imaging tests include:
  - *Chest X-ray*. A chest x-ray shows an image of the lung. A nodule that is big enough can be seen. Small nodules may not always show up on an x-ray image.
  - *Computed tomography (CT) scan*. This test shows smaller nodules more clearly than an x-ray.
  - *Positron emission tomography (PET) scan*. A radioactive substance is put into the blood stream through an IV. Then, the scan takes a picture of the lungs. A malignant nodule will absorb the radioactive substance faster than a benign nodule.
- **Procedure Tests**: A biopsy may be done to help decide if the nodule is cancerous or not. A biopsy removes

a tiny piece of the nodule so the tissue can be looked at under a microscope. Some of these tests include:

- *Bronchoscopy*. A bronchoscopy uses a thin tube (a *scope*) with a tiny camera and light on the end. The scope is put in the windpipe. The caregiver can then see inside the lung. A tiny tool put through the scope is used to take a small sample of the nodule tissue.
- *Transthoracic needle aspiration*. In this procedure, a long needle is put through the chest into the lung. Sometimes a CT scan is done at the same time. A CT scan can make it easier to locate the nodule so a biopsy can be taken.
- *Surgical lung biopsy*. This is a surgical procedure in which the nodule is removed. This is usually done when the nodule is most likely malignant or a biopsy cannot be obtained by either bronchoscopy or transthoracic needle aspiration.

➢ **Other tests:**

- *Blood tests*. They can show if you have been exposed to a bacterial, fungal or viral infection.
- *Tuberculin (TB) test*. This is a skin test. It can tell if you have been exposed to the germ that causes *tuberculosis*. Tuberculosis is a type of lung disease.

WHEN TO SEEK MEDICAL CARE:

While waiting for test results to determine what type of pulmonary nodule you have, be sure to contact your caregiver if you:

- Develop a cough that does not go away.
- Have trouble breathing when you are active.
- Feel sick or unusually tired.
- Do not feel like eating.
- Lose weight without trying to.
- Develop chills or night sweats.
- Develop a fever of more than 100.5° F (38.1° C).

SEEK IMMEDIDIATE MEDICAL CARE IF:

- Your breathing problems become much worse.
- You begin wheezing.
- You cannot stop coughing.
- You cough up blood.
- You suddenly feel weak.
- You have sudden chest pain.
- You develop a fever of more than 102.0° F (38.9° C).

MAKE SURE YOU

- Understand these instructions.
- Will watch your condition.
- Will get help right away if you are not doing well or get worse.

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