

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

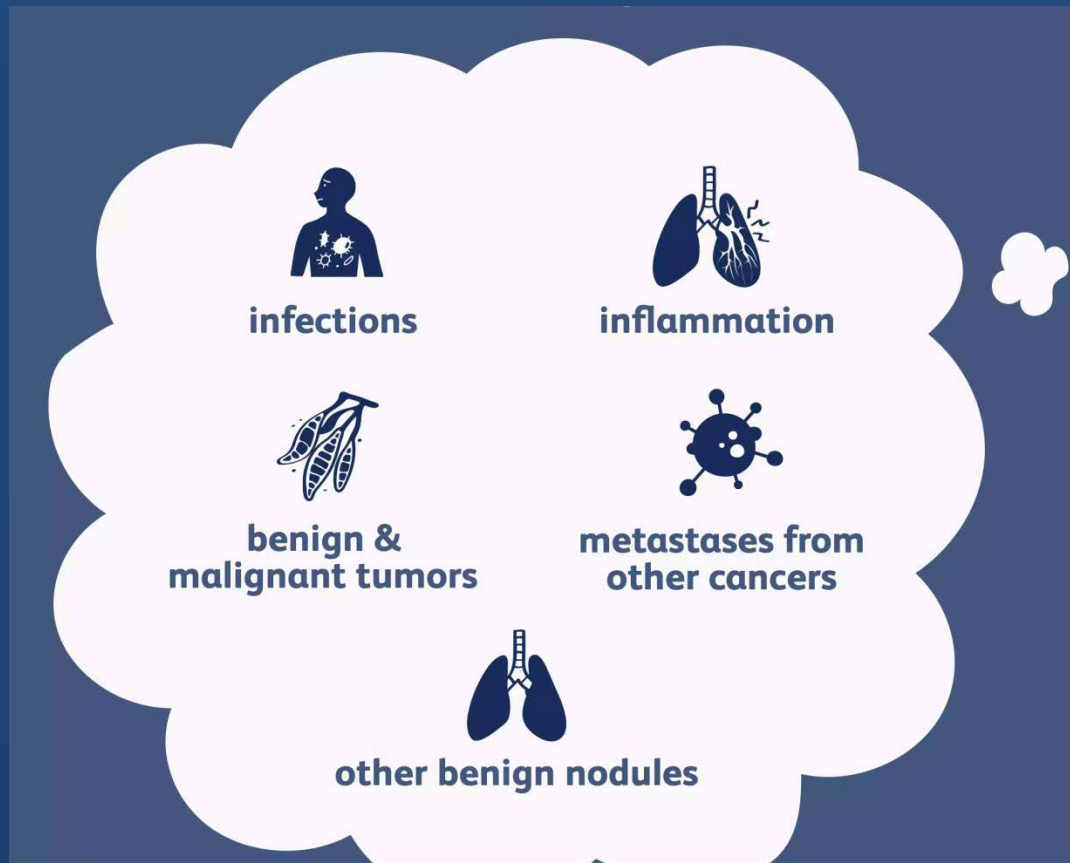
EVALUATION OF LUNG NODULES

Mohammad-Reza Masjedi,M.D

Prof.Pulmonary medicine

- Lung nodules are "spots" that are 3 centimeters (1.5 inches) in diameter or less, "Coin Lesions".
- Lesions larger than 3 cm are referred to as lung masses.
- Lung nodules usually need to be at least one centimeter in size before they can be seen on a chest x-ray, whereas nodules as small as one to two millimeters may sometimes be seen on a CT scan.

LUNG NODULE CAUSES



- The *majority*—at least 60 percent of lung nodules overall—are *not* cancerous.
- If a nodule is lung cancer there is still a good chance that it can be cured.
- A nodule, by definition, is less than three centimeters in diameter, and at this size, many lung cancers are very curable.
- History of smoking is important and can help estimate the chance that the nodule is malignant or benign.

- Currently, there are more former smokers and never smokers who develop lung cancer, than people who smoke.
- In fact, lung cancer has been significantly increasing among one group: young, never-smoking women.



PREVALENCE

- Lung nodules are quite common and are found on one in 500 chest x-rays, and one in 100 CT scans of the chest.
- Approximately 150,000 lung nodules are detected in people in the United States each year.
- Roughly half of people over the age of 50 who smoke will have nodules on a CT scan of their chest.

SYMPTOMS

- Most lung nodules do not cause any symptoms and are found “accidentally” or “incidentally”
- Cough, coughing up blood, wheezing, shortness of breath (often vague at first and only with activity), or respiratory infections if the nodule(s) is located near a major airway.

CAUSES

- Benign
 1. Infections:
 - ☐ Bacterial:TB
 - ☐ Fungal: Histoplasmosis , Aspergillosis...
 - ☐ Parasitic: Ascariasis , Hydatid Cysts

When the immune system "walls off" areas of infection it often forms granulomas.

CAUSES

- Benign

2. Inflammation:

- ☐ Rheumatoid Arthritis
- ☐ Sarcoidosis
- ☐ Granulomatosis with polyangiitis
- ☐ pneumoconioses such as silicosis

CAUSES

- Benign

3. Tumors

- ☐ Hamartomas (the most common benign lung tumor)
- ☐ Bronchial adenomas
- ☐ Fibromas
- ☐ Blastomas
- ☐ Neurofibromas
- ☐ Hemangiomas

CAUSES

- Malignant
 - ❖ Primary Cancers
 - ❑ lung cancer
 - ❑ Lymphomas
 - ❑ Sarcomas
 - ❑ carcinoid tumors (neuroendocrine tumors)

CAUSES

- Malignant

- ❖ Metastases

- ☐ Breast Cancer

- ☐ Colon Cancer

- ☐ Bladder Cancer

- ☐ Prostate Cancer

(often multiple lung nodules)

CAUSES

- Other benign nodules
 - ❑ Pulmonary infarctions
 - ❑ AV malformations
 - ❑ Atelectasis
 - ❑ Pulmonary fibrosis
 - ❑ Amyloidosis

DIAGNOSIS

- ❑ Previous X-Rays
- ❑ If the nodule or nodules have been present for a long time, further tests may not be needed
- ❑ If the nodule is new or no prior X-Rays, further work-up
- ❑ History: Occupation , Smoking , Travel...
- ❑ If a nodule does not appear to be growing or has characteristics of a benign tumor, (has "low probability" of being cancer) "wait and watch",repeat CT.
- ❑ Single solitary nodules that have remained unchanged for a period of two or more years do not generally need any further workup.

- when a lung nodule is found in a person who might be expected to have lung metastases ,only **half** of the nodules were metastases when biopsied
- Rather, up to 25 percent, were a second primary lung cancer.
- The likelihood that a lung nodule is cancer is 40 percent
- In people younger than 35, the chance that a lung nodule is malignant is less than 1 percent
- Half of lung nodules in people over 50 are cancerous

