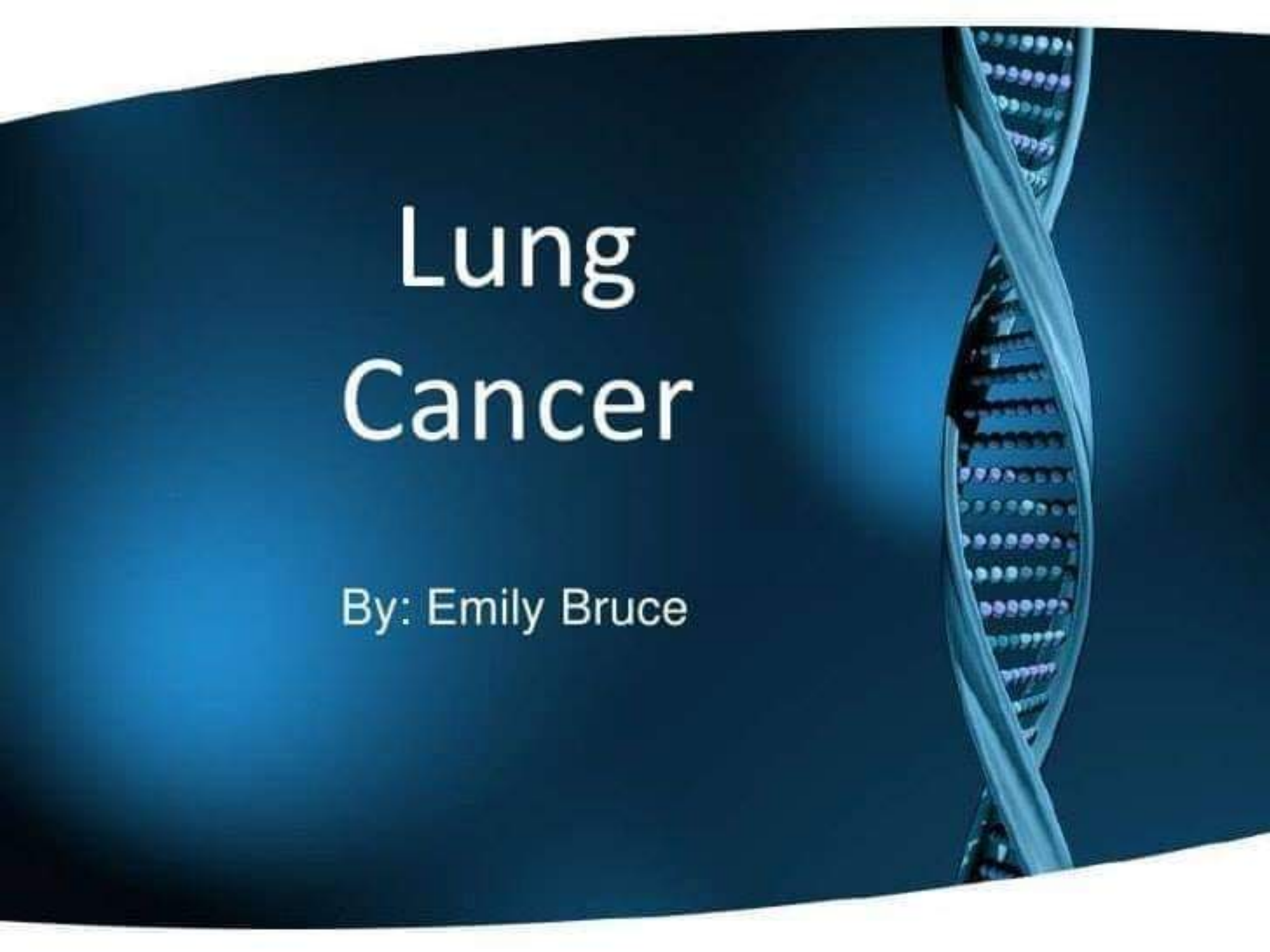
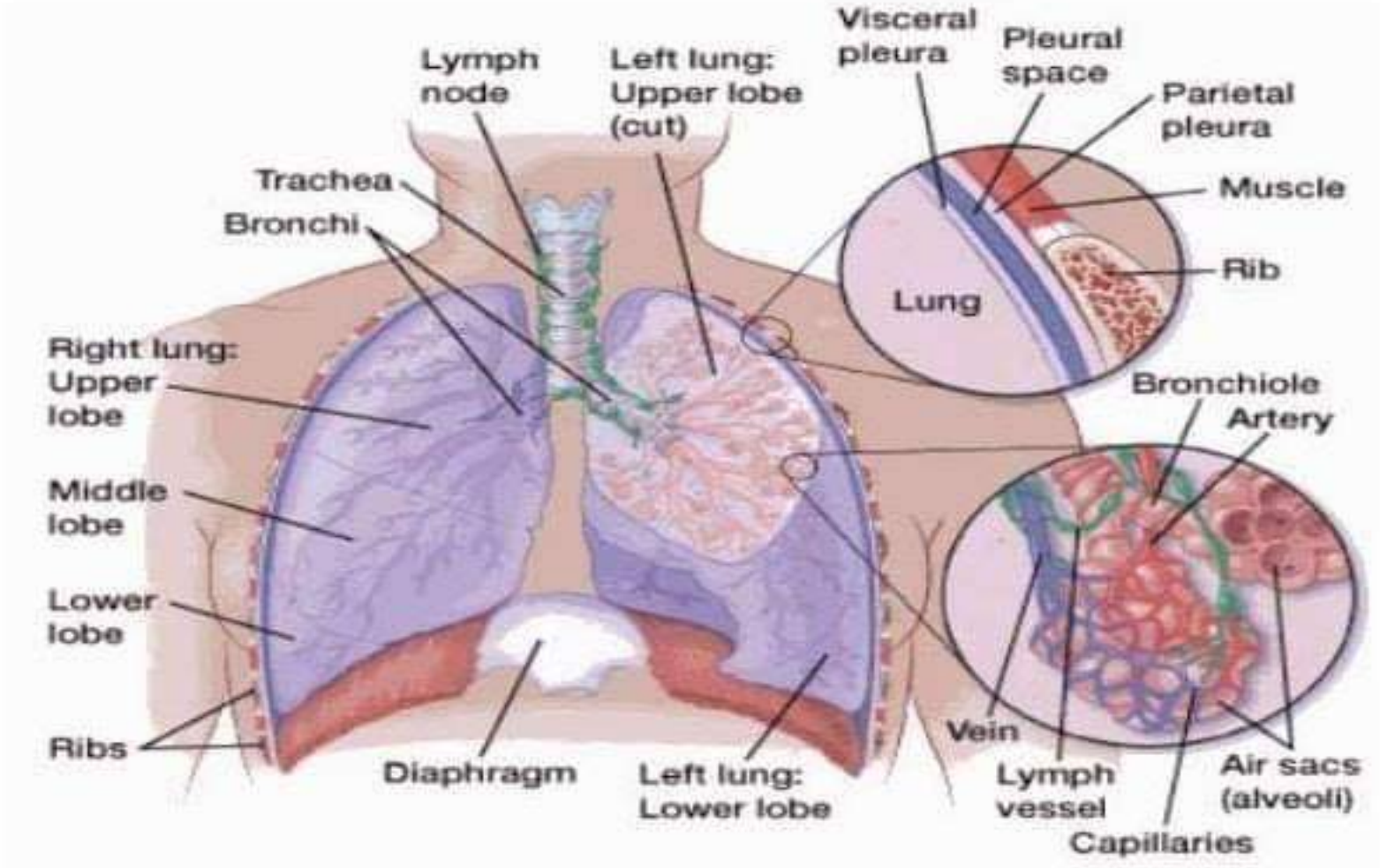
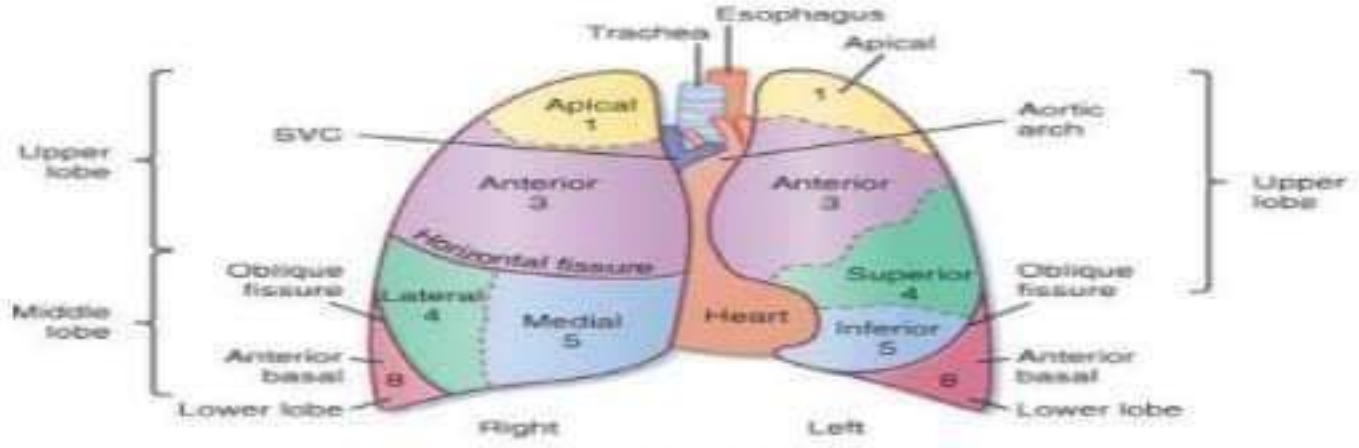
# Lung Cancer

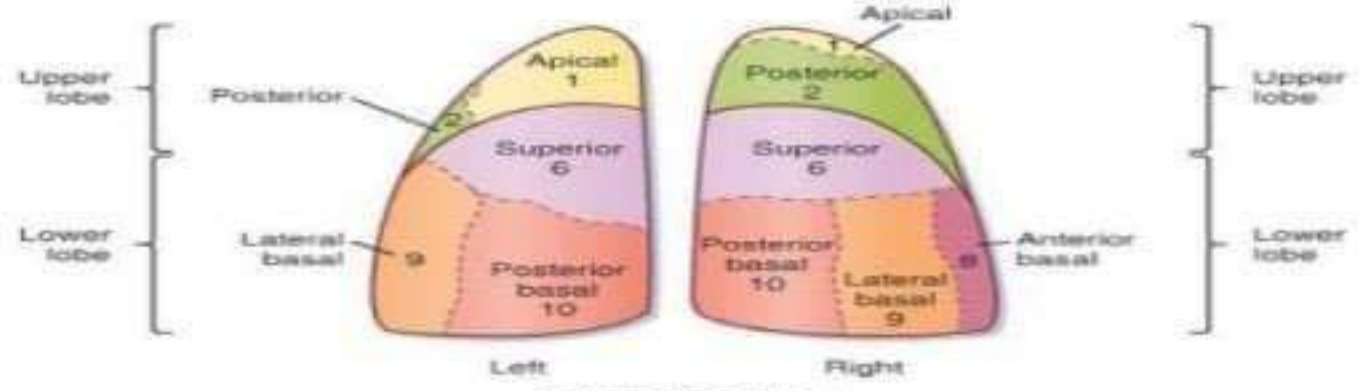
By: Emily Bruce



# REVIEW:

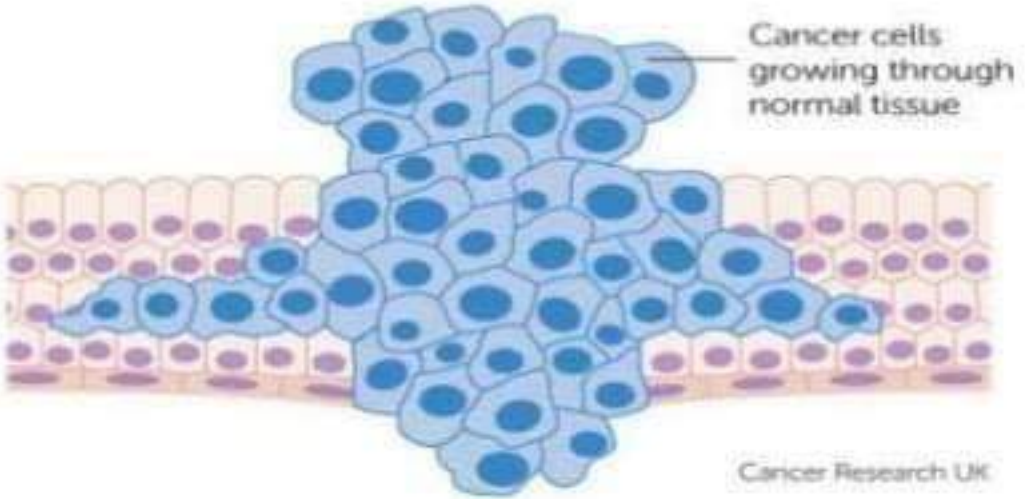

Lymph node
Left lung: Upper lobe (cut)
Visceral pleura
Pleural space
Parietal pleura
Trachea
Bronchi
Muscle
Rib
Lung
Right lung: Upper lobe
Middle lobe
Lower lobe
Bronchiole
Artery
Ribs
Diaphragm
Left lung: Lower lobe
Vein
Lymph vessel
Air sacs (alveoli)
Capillaries



# DEFINITION:-

- **Lung carcinoma, is a malignant lung tumor characterized by uncontrolled cell growth in tissues of the lung. If left untreated, this growth can spread beyond the lung by the process of metastasis into nearby tissue or other parts of the body**



# INCIDENCE OF LUNG CANCER:-

- Lung cancer mainly occurs in older people. About 2 out of 3 people diagnosed with lung cancer are 65 or older.
- About 14% of all new cancers are lung cancers.
- About 224,390 new cases of lung cancer (117,920 in men and 106,470 in women)

# TYPES OF LUNG CANCER:-

# Non-small cell lung cancer (NSCLC) :

- Most common type
- About 80-85% are NSCLC
- Grows more slowly

- It is further classified into the following:-

- **Epidermoid carcinoma or Squamous cell carcinoma:**
  - 30-35% of lung cancer
  - Arise from bronchial epithelium
  - Cavitation may also occur
  - Slow growth, metastasis not common

## ❑Adenocarcinoma:

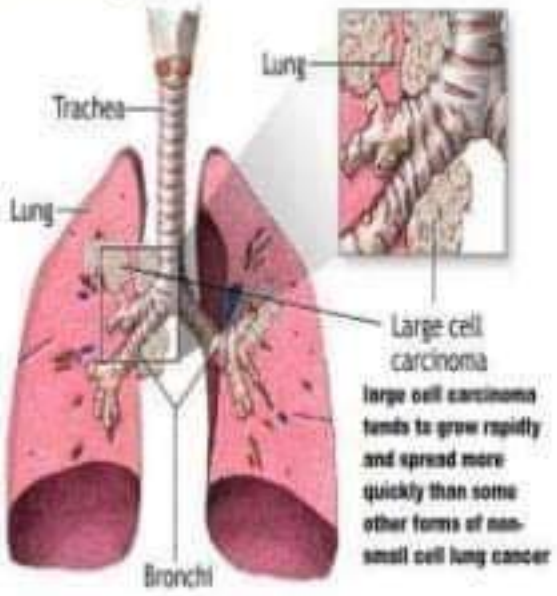
- 25-30% of lung cancer
- Arise from bronchiole mucus gland
- Slow growth,
- Rarely cavity
- Strongly linked to cigarette smoking

## ❑Large cell caracinoma:

- 10-20% of lung cancer
- Cavitation common
- Slow, metastasis may occur to kidney, liver and adrenals
- May be located centrally, mid lung or peripherally

# Small cell carcinoma :

- It generally starts in one of the larger breathing tubes, grows fairly rapidly, and is likely to be large by the time of diagnosis.
  - Spreads more quickly and aggressively
  - Accounts for 15% of cases
  - Found mostly in heavy smokers



# ETIOLOGY:-

- **Tobacco smoke:-**
  - Smoking is by far the leading risk factor for lung cancer. About 80% of lung cancer deaths are thought to result from smoking.

- **Exposure to other cancer-causing agents in the workplace :**
  - Radioactive such as uranium
  - Inhaled chemicals such as beryllium, silica , coal products, mustard gas.

- **Certain dietary supplements :-**
  - 2 large studies found that smokers who took beta carotene supplements actually had an increased risk of lung cancer.
- **Exposure to asbestos:-**
  - People who work with asbestos (such as in mines, mills, textile plants, places.
- **Talc and talcum powder:**
  - Talc is a mineral that in its natural form may contain asbestos.

# PATHOPHYSIOLOGY:-

DUE TO ETIOLOGICAL FACTORS

↓

DAMAGE TO THE CELL

↓

CARCINIGEN BIND TO DAMAGED CELL DNA

↓

CELLULAR CHANGES

↓

PASSED TO THE DAUGHTER CELL

↓

EVENTUALLY MALIGNANT CELL

↓

MALIGNANT TRANSFORM FROM NORMAL EPITHELIUM

↓

CARCINOMA

# SIGN AND SYMPTOMS:

- ✓A cough that gets worse
- ✓sputum (spit or phlegm)
- ✓Chest pain that is often worse with deep breathing, coughing, or laughing
- ✓Coughing up blood
- ✓Hoarseness
- ✓Weight loss and loss of appetite
- ✓Shortness of breath
- ✓Feeling tired or weak
- ✓Infections such as bronchitis and pneumonia

- Bone pain (like pain in the back or hips)
  - Nervous system changes (such as headache, weakness, dizziness, balance problems, or seizures), from cancer spread to the brain or spinal cord.

- Yellowing of the skin and eyes (jaundice), from cancer spread to the liver.

# HORNER SYNDROME

- HORNER SYNDROME Cancers of the top part of the lungs (sometimes called Pancoast tumors) sometimes can affect certain nerves to the eye and part of the face, causing a group of symptoms called Horner syndrome:
  - Drooping or weakness of one eyelid
  - Reduced or absent sweating on the same side of the face sometimes cause severe shoulder pain.

- **SUPERIOR VENA CAVA SYNDROME**
  - Tumors in this area can press on the SVC, which can cause the blood to back up in the veins. This can lead to swelling in the face, neck, arms, and upper chest.
- **PARANEOPLASTIC SYNDROMES:-**
  - Some lung cancers can make hormone-like substances that enter the bloodstream and cause problems with distant tissues and organs, even though the cancer has not spread to those tissues or organs. These problems are called paraneoplastic syndromes.
    - Excess growth/thickening of certain bones, especially those in the finger tips
    - Excess breast growth in men (gynecomastia)

# STAGES OF CANCER

American Joint Committee on Cancer (AJCC) TNM system, which is based on:

| Sr. No | STAGE | FEACTURES |
|---|---|---|
| **The size of the main (primary) tumor (T)** | **To:** | There is no evidence of a primary tumor. |
| | **T1:** | The tumor is no larger than 3 centimeters, not reached PLEURA |
| | **T2:** | The tumor has 1 or more, larger than 3 cm across but not larger than 7 cm. BROCHUS |
| | **T3:** | The tumor has 1 or more of the following features, It is larger than 7 cm across CHEST WALL |
| | **T4:** | The cancer has 1 or more, A tumor of any size has grown into the space between the lungs |

| Sr. No | STAGE | FEACTURES |
|---|---|---|
| Whether the cancer has spread to nearby (regional) lymph nodes (N). | N0: | There is no spread to nearby lymph nodes. |
| | N1: | The cancer has spread to lymph nodes within the lung , bronchus enters the lung |
| | N2: | The cancer has spread to lymph nodes around the carina , mediastinum |
| | N3: | The cancer has spread to lymph nodes near the collarbone on either side |

| Sr. No | STAGE | FEACTURES |
|---|---|---|
| **M categ-ories for lung cance r** | **Mo:** | No spread to distant organs or areas. This includes the other lung, lymph nodes |
| | | away than those mentioned in the N stages above, and other organs |
| | **M1a:** | The cancer has spread to the other lung.<br>• Cancer cells are found in the fluid around the lung |
| | **M1b** | The cancer has spread to distant lymph nodes or to other organs |

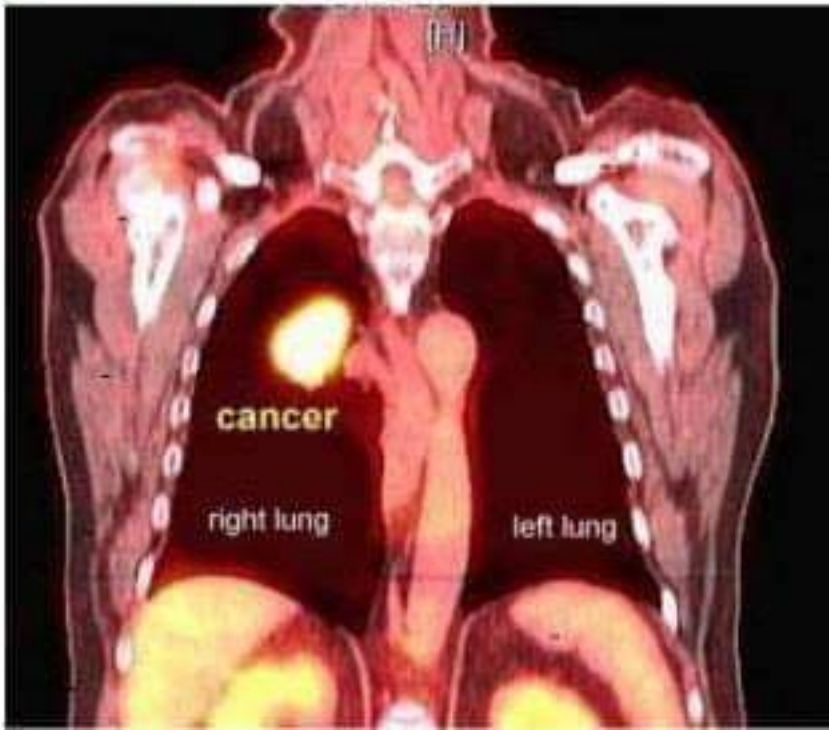
# DIGNOSTIC EVALUATION:-

- **Medical history and physical exam:-**
- **Blood tests:-**
  - **A complete blood count (CBC)** looks at whether patient blood has normal numbers of different types of blood cells.
  - **Blood chemistry tests** can help spot abnormalities in some of patient organs, such as the liver or kidneys. For example, e.g. high level of lactate dehydrogenase (LDH).

# IMAGING TESTS:-

- **Chest x-ray**
  - This is often the first test will do to look for any abnormal areas in the lungs.
- **Computed tomography (CT) scan:-**
  - A CT scan uses to make detailed cross-sectional images of patient body.
  - can show the size, shape, and position of any lung tumors and can help find enlarged lymph nodes
- **CT-guided needle biopsy:**
  - If a suspected area of cancer is deep within patient body, a CT scan can be used to guide a biopsy needle into the suspected area.

- **Positron emission tomography (PET) scan:-**
  - For this test, a form of radioactive sugar (known as FDG) is injected into the blood.
  - This radioactivity can be seen with a special camera. PET/CT scan.



- **Needle biopsy:-** can often use a hollow needle to get a small sample from a suspicious area (mass).
  - **fine needle aspiration (FNA) biopsy**,
  - **core biopsy**.
- **Bronchoscopy:-**
  - Bronchoscopy can help the find some tumors or blockages in the lungs.
- **Thoracoscopy:-**
  - spread to the spaces between the lungs and the chest wall, or to the linings

# MANAGEMENT:-

- MEDICAL MANAGEMENT:-
- **PHOTODYNAMIC THERAPY (PDT):-**
  - This type of treatment can be used to treat very early-stage lung cancers that are only in the outer layers of the lung airways,

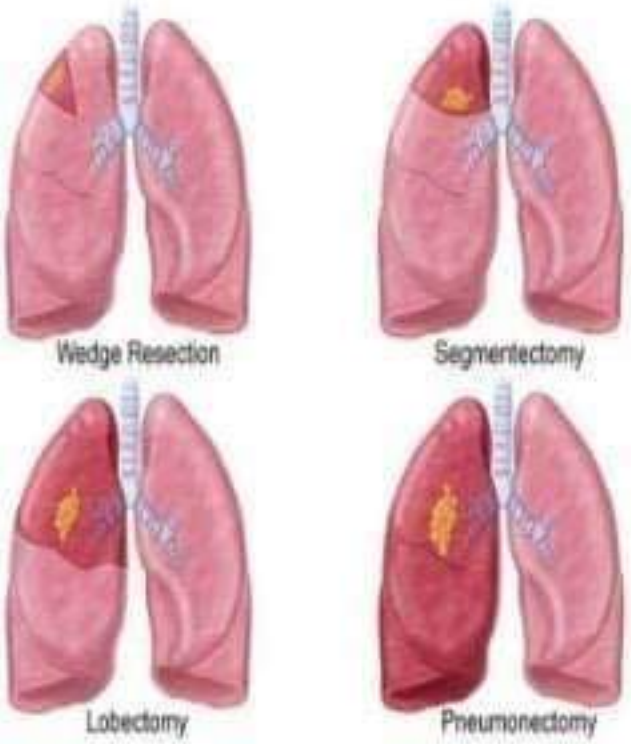
- **THORACENTESIS:-**
  - This is done to drain the fluid.

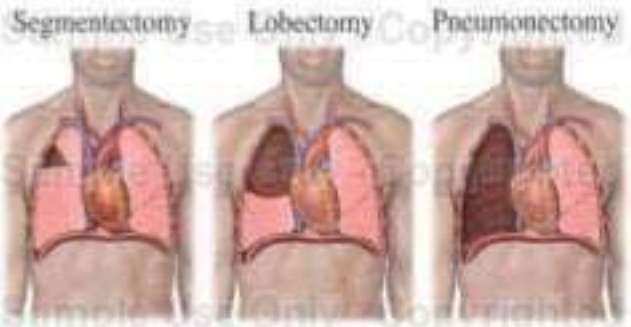
- **LASER THERAPY:-**
  - used to treat very small tumors in the linings of airways.
  - open up airways blocked by larger tumors to help people breathe better.
- PHARMACOLOGICAL MANAGEMEN:-
- CHEMOTHERAPY
- for lung cancer Chemotherapy (chemo) is treatment with anti-cancer drugs injected into a vein or taken by mouth. These drugs enter the bloodstream and go throughout the body, making this treatment useful for cancer anywhere in the body

| SR.NO | NAME OF DRUGS | DOSE | SIDE EFFECT |
|---|---|---|---|
| 1 | • Cisplatin | 75-100 mg/m² IV, 4Weeks | Hair loss<br>• Mouth sores<br>• Loss of appetite<br>• Nausea and vomiting<br>•Diarrhea/ constipatio<br>Easy bruising or bleeding (from having too few blood platelets)<br>• Fatigue |
| 2 | • Carboplatin | 200 mg/m2 IV on day 1 | |
| 3 | • Paclitaxel (Taxol) | 135 mg/m2, IV over 24 hours, every 3 weeks | |
| 4 | • Albumin-b | 25 g (5% or 25% solution) IV infusion | |
| 5 | • Docetaxel (Taxotere) | 75 mg/m² IV over 1 hour 3Weeks | |
| 7 | • Vinorelbine (Navelbine) | 25 mg/sq.meter IV Week with IV cisplatin 100 mg/sq.meter 4Weeks | |
| 9 | Vinblastine | 4 mg/sq. meter, 2week | |

# SURGICAL MANAGEMENT:-

- • **Lobectomy:**
  - In this surgery, the entire lobe containing the tumor is removed.
- • **Segmentectomy or wedge resection:**
  - In these surgeries, only part of a lobe is removed. This approach might be used, for example, if a person doesn't have enough lung function to withstand removing the whole lobe.
- **Pneumonectomy:**
  - This surgery removes an entire lung. This might be needed if the tumor is close to the center of the chest.



## VIDEO-ASSISTED THORACIC SURGERY (VATS)

- Increasingly, treat early-stage lung cancers in the outer parts of the lung with a procedure called video-assisted thoracic surgery (VATS), which requires smaller incisions than a thoracotomy.
- During this operation, a thin, rigid tube with a tiny video camera on the end is placed through a small cut in the side of the chest to help the surgeon see inside the chest on a TV monitor.
- One of the incisions is enlarged if a lobectomy or pneumonectomy is done to allow the specimen to be removed. Because only small incisions are needed, there is usually less pain after the surgery and a shorter hospital stay – typically 4 to 5 days.

# RADIOFREQUENCY ABLATION (RFA)

- RFA uses high-energy radio waves to heat the tumor. A thin, needle-like probe is put through the skin and moved in until the tip is in the tumor. Placement of the probe is guided by CT scans. Once the tip is in place, an electric current is passed through the probe, which heats the tumor and destroys the cancer cells.
- might have some pain where the needle was inserted for a few days after the procedure. Major complications are uncommon, but they can include the partial collapse of a lung or bleeding into the lung.

# PALLIATIVE PROCEDURES FOR LUNG CANCER

- Palliative, or supportive care, is aimed at relieving symptoms and improving a person's quality of life.

- **ISSUES ARE ADDRESSED IN PALLIATIVE CARE:-**
  - **Physical.**
  - **Emotional and coping.**
  - **Spiritual.**