



### What is lung cancer?

- ✓ Lung Cancer is an uncontrollable growth of cells that begins in the lungs and later spreads to the other parts of the body.
- ✓ It is the second most common cancer in men and women across the globe.
- ✓ It is among people who smoke or work in chemical exposed conditions.
- ✓ It increases with the passage of time and reduces their length of life to a significant level.

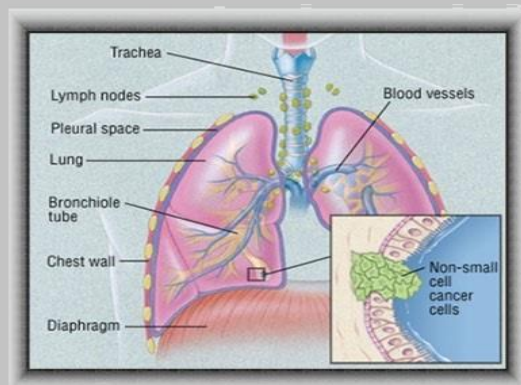
### What are the symptoms?



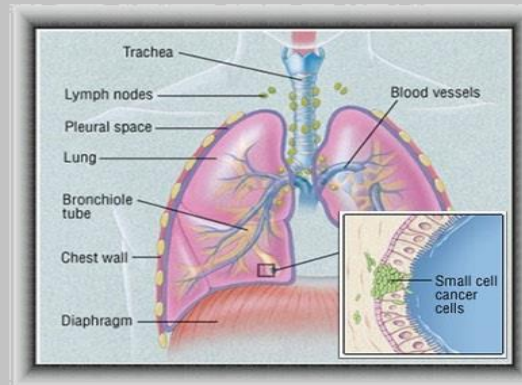
### Major types of Lung Cancer?

There are two types of Lung Cancer:

- 1- **NSCLC**- Non- Small Cell Lung Cancer (20% Death)
- 2- **SCLC**- Small Cell Lung Cancer (80% Death)



**NSCLC or Non-Small Cell Lung Cancer**



**SCLC or Small Cell Lung Cancer**

## Causes?

- History of heavy smoking means currently smoke or have quit within the past 15 years.
- Age between 55 and 80 years old.
- The person has family history/mutation.
- Air pollution.

## Diagnosis of Lung Cancer:

There are 4 different steps -

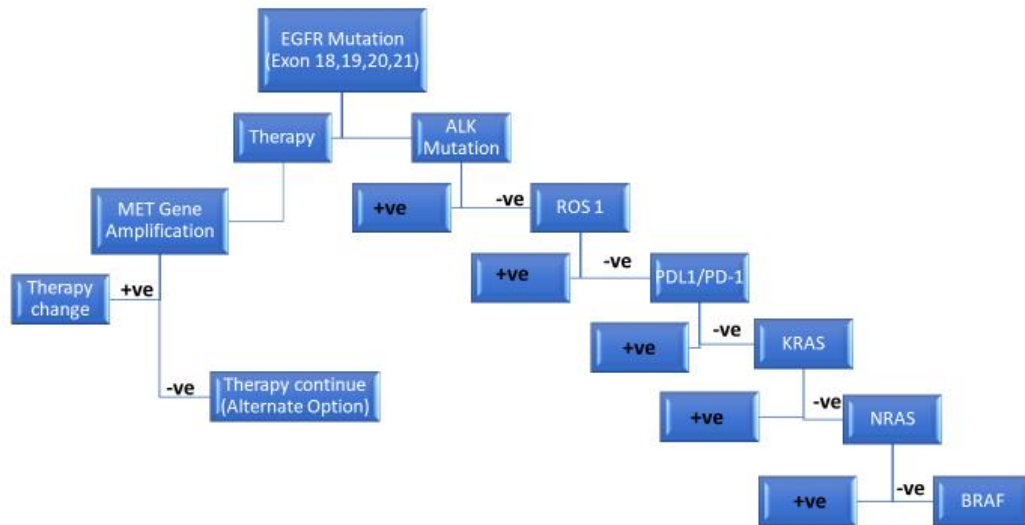
### 1. Screening:

FNAC – Fine Needle Aspiration Cytology

### 2. Diagnosis:

- Histopathology (Biopsy)
- IHC Markers-CEA (Carcino Embryonic Antigen), Cytokeratin 5/6, 7/20, Neuron Specific Enolase etc.
- **IHC markers-Final Diagnosis Panel**

### 3. Prognosis:



#### 4. Monitoring Marker:

CEA, SCC, NSE, CYFRA 21-1, TPA

#### Detail information about the test:

<p><b>1. EGFR Mutation by Arms PCR:</b></p> <ul style="list-style-type: none"> <li>EGFR gene mutations went undetected by amplification refractory mutation system-Scorpion real-time PCR (ARMS-PCR).</li> <li>The ARMS method demonstrated higher sensitivity than Sanger sequencing.</li> <li>It detects approximately 29 different mutations.</li> </ul>	<p><b>2. EGFR Mutation detection:</b></p> <ul style="list-style-type: none"> <li>An EGFR mutation refers to a mutation (damage) to the portion of the DNA in a lung cancer cell which carries the recipe for making EGFR proteins.</li> <li>EGFR has become an important therapeutic target for the treatment of these tumors.</li> <li>More recent trials have suggested that for advanced NSCLC patients with EGFR mutant tumors, initial therapy with a TKI instead of chemotherapy may be the best choice of treatment.</li> </ul>
<p><b>3. ALK mutation by FISH:</b></p> <ul style="list-style-type: none"> <li>ALK FISH probe is the FDA approved approach for detection of ALK rearrangements in lung carcinoma patients who may benefit from ALK kinase inhibitors.</li> <li>Approximately 3-5% of NSCLC have a rearrangement of the ALK gene, resulting in fusion between ALK &amp; another gene, ALK activation, impaired apoptosis, and abnormal cell proliferation.</li> </ul>	<p><b>4. ALK D5F3:</b></p> <ul style="list-style-type: none"> <li>ALK D5F3 detects eligibility for tyrosine inhibitor (TKI) therapy primarily in individuals with pulmonary by identifying ALK fusion proteins.</li> <li>ALK rearrangements is a very important process in treatment decision making for advanced non-small-cell lung cancer (NSCLC).</li> <li>ALK (D5F3) CDx immunohistochemistry assay was approved by the US Food and Drug Administration as a standalone test</li> </ul>

	for <i>ALK</i> rearrangements in lung cancer in 2015.
<b>5. NRAS mutation:</b> <ul style="list-style-type: none"> <li>Determination of NRAS status play a role in determining the outcome of therapy in colorectal carcinoma.</li> <li>Absence of NRAS mutation within the tumor suggests that the patient may respond to therapy.</li> </ul>	<b>6. KRAS mutation Detection/Extended KRAS mutation:</b> <ul style="list-style-type: none"> <li>RAS mutations are commonly found in cancer tissue, causing a permanent activation of the signal transduction pathway downstream of the EGF receptor (EGFR), thus positive signalling for cell growth.</li> <li>Most frequent are KRAS mutations in codons 12,13 in the second (first transcribed) exon. Up to 45% of all colorectal cancer patients exhibit KRAS 12,13 mutations, while another 10-15% may have mutations in KRAS exons 3 &amp; 4.</li> </ul>
<b>7. BRAF mutation:</b> <ul style="list-style-type: none"> <li>BRAF Mutation is found in a variety of cancers. Patients exhibiting these mutations benefit from BRAF inhibitors.</li> </ul>	<b>8. ROS1:</b> <ul style="list-style-type: none"> <li>ROS 1 is a receptor tyrosine kinase with structural similarity to Anaplastic Lymphoma Kinase (ALK) protein.</li> <li>ROS1 originally described in Glioblastomas, has been identified as a potential relevant therapeutic target in lung Adenocarcinoma.</li> <li>FISH is better-suited than molecular testing to detect the spectrum of variants of ROS1 gene.</li> </ul>
<b>9. PDL1:</b> <ul style="list-style-type: none"> <li>PDL1 is a protein that helps keep immune cells from attacking nonharmful cells in the body.</li> <li>This is a liquid biopsy test based on lung NCCN guidelines and includes PD-L1 using circulating tumor cells as the sample.</li> <li>This test helps in deciding the therapy based on the mutation profile of the patient.</li> <li>If your results show your tumor cells have high levels of PDL1, you may be started on immunotherapy. If your results do not show high levels of PDL1, immunotherapy may not be effective for you.</li> </ul>	

**Target Doctors:**

- ✓ Medical Oncologist
- ✓ Surgical Oncologist
- ✓ Radiation Oncologist