

# NSCLC Disease State

## LUNG CANCER

### STATISTICS >



**3<sup>rd</sup>**  
Most common  
cancer in the US

### SIGNS, SYMPTOMS, AND RISK FACTORS >

**80–90%**

of deaths worldwide are  
associated with tobacco smoke

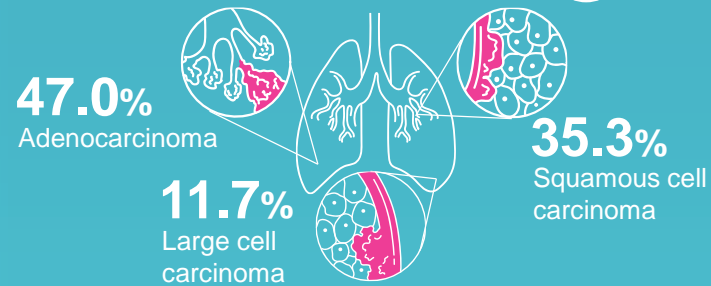


### SUBTYPES >



## NSCLC

### SUBTYPES AND LOCATION >



### DISEASE CLASSIFICATION AND SURVIVAL >

NSCLC is  
classified in  
**I to IV**  
stages

5-year relative survival rate  
**≈ 6.4%**  
at diagnosis for  
metastatic disease

### METASTATIC DISEASE >



**~50%**  
patients have metastatic  
disease at diagnosis

### ONCOGENIC DRIVERS >

In adenocarcinoma,  
about

**60%**  
of patients  
have 1 known  
oncogenic driver



In squamous cell  
carcinoma, about

**50–80%**  
of patients have 1  
known oncogenic  
driver



### NCCN CLINICAL PRACTICE GUIDELINES IN ONCOLOGY (NCCN GUIDELINES®) – RECOMMENDED TREATMENT >



Surgery



Radiation



Systemic  
therapies

### QUALITY OF LIFE >

Disease-related symptoms such  
as fatigue, pain, dyspnea,  
anorexia, and cough





# Lung Cancer: Key Global and US Statistics



**3<sup>rd</sup>** most common cancer in the US<sup>1</sup>

Estimated new cases in 2022  
**236,740**

Estimated deaths in 2022  
**130,180**

Median age at diagnosis  
**71 years**



**2<sup>nd</sup>** most common cancer globally<sup>2</sup>

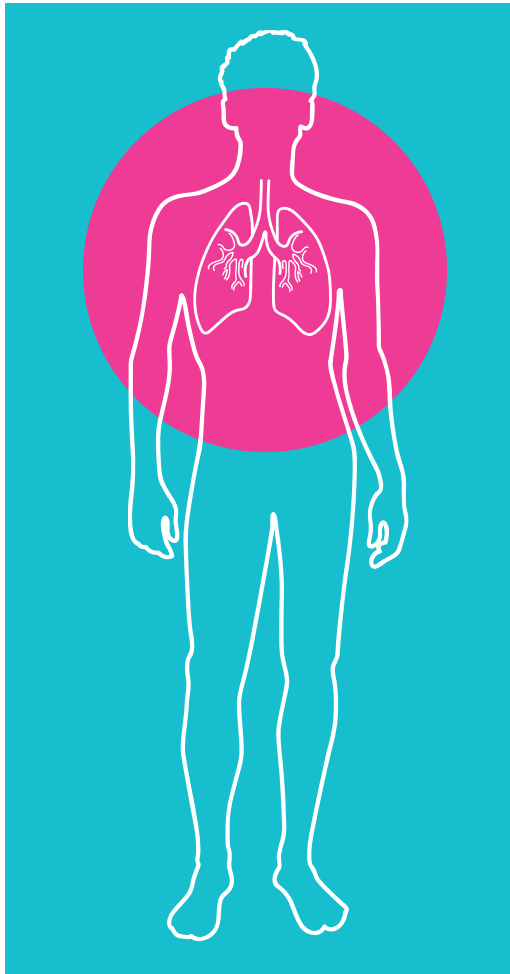
Estimated new cases in 2020  
**2,206,771**

Estimated deaths in 2020  
**1,796,144**

## ESTIMATED NUMBER OF NEW CASES AND DEATHS BY CANCER TYPE, 2022<sup>1</sup>

Common types of Cancer	Estimated new cases 2022	Estimated deaths 2022
Breast cancer (female)	287,850	43,250
Prostate cancer	268,490	34,500
<b>Lung and bronchus cancer</b>	<b>236,740</b>	<b>130,180</b>
Colorectal cancer	151,030	52,580
Melanoma of the skin	99,780	7650
Bladder cancer	81,180	17,100
Non-Hodgkin lymphoma	80,470	20,250
Kidney and renal pelvis cancer	79,000	13,920
Uterine cancer	65,950	12,550
Pancreatic cancer	62,210	49,830

# Lung Cancer: Signs, Symptoms, and Key Risk Factors



Symptoms of lung cancer are often linked to other conditions and are not specific to lung cancer, making early detection challenging. However, symptoms might become apparent in the later stages of the disease<sup>1</sup>

## EARLY LUNG CANCER SYMPTOMS MAY INCLUDE<sup>1</sup>:

- Persistent cough
- Chest pain and breathing problems
- Persistent bronchitis and pneumonia
- Loss of appetite
- Unexplained weight loss
- Feeling tired or weak

## INTRINSIC RISK FACTORS<sup>2-8</sup>:

- Age: Median age of 71 years
- Gender: Women have a higher risk for developing lung cancer
- Race: African Americans have the highest incidence
- Previous radiation therapy to lungs
- Inherited and acquired gene changes
- Prior lung disease, such as COPD or pulmonary fibrosis

## LUNG CANCER METASTASES SYMPTOMS MAY INCLUDE<sup>1</sup>:

- Bone pain
- Nervous system changes (headache, weakness or numbness of an arm or leg, dizziness, balance problems, or seizures)
- Jaundice
- Swelling of lymph nodes, such as those in the neck or above the collarbone

## ENVIRONMENTAL RISK FACTORS<sup>2-5</sup>:

- Tobacco smoke: ~80–90% lung cancer deaths worldwide
- Secondhand smoke: >7000 deaths each year in the US
- Exposure to certain chemicals
- Air pollution
- Beta carotene supplements in heavy smokers
- Arsenic

COPD, chronic obstructive pulmonary disease.

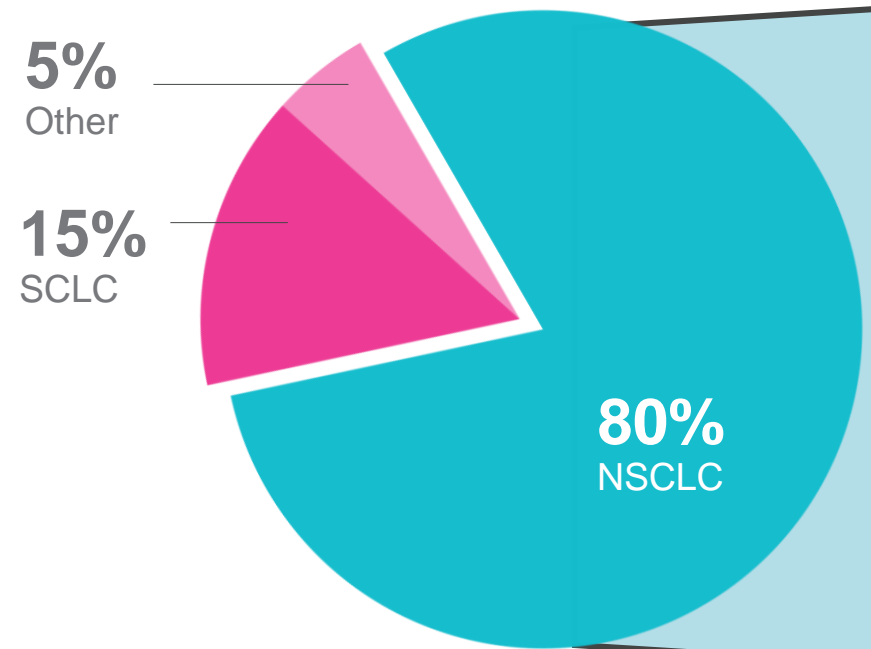
1. Signs and Symptoms of Lung Cancer. American Cancer Society. <https://www.cancer.org/cancer/lung-cancer/detection-diagnosis-staging/signs-symptoms.html> (accessed August 2022); 2. Reducing Your Risk. Lungevity. <https://www.lungevity.org/for-patients-caregivers/lung-cancer-101/reducing-your-risk> (accessed August 2022); 3. Lung Cancer Risk Factors. American Cancer Society. <https://www.cancer.org/cancer/lung-cancer/causes-risks-prevention/risk-factors.html> (accessed August 2022); 4. What Causes Lung Cancer? American Cancer Society. <https://www.cancer.org/cancer/lung-cancer/causes-risks-prevention/what-causes.html> (accessed August 2022); 5. Non-Small Cell Lung Cancer Treatment (PDQ®)—Health Professional Version. National Cancer Institute. [https://www.cancer.gov/types/lung/hp/non-small-cell-lung-treatment-pdq#\\_48494](https://www.cancer.gov/types/lung/hp/non-small-cell-lung-treatment-pdq#_48494) (accessed August 2022); 6. Cancer Stat Facts: Lung and Bronchus Cancer. SEER Program, National Cancer Institute. <https://seer.cancer.gov/statfacts/html/lungb.html> (accessed August 2022). 7. Gasperino J Med Hypotheses. 2013; 76: 328-331 8. Race and ethnicity as cancer risk factors. MD Anderson Cancer Centre. <https://www.mdanderson.org/cancerwise/race-and-ethnicity-as-cancer-risk-factors.h00-158592156.html> (accessed August 2022).



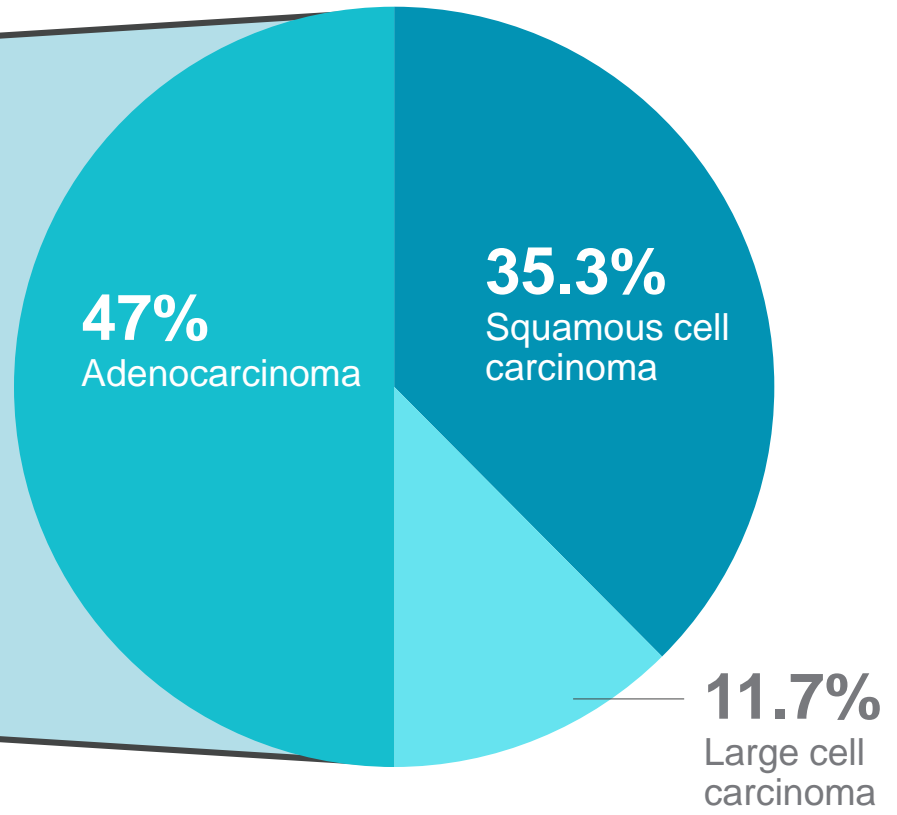
# Lung Cancer: Subtypes



## LUNG CANCER DISTRIBUTION



## NSCLC SUBTYPES BY HISTOLOGY



NSCLC, non-small cell lung cancer; SCLC, small cell lung cancer.  
1. Types of Lung Cancer. Lungevity. <https://www.lungevity.org/for-patients-caregivers/lung-cancer-101/types-of-lung-cancer> (accessed August 2022).



# NSCLC: Subtypes and Location



## LOCATION OF HISTOLOGICAL SUBTYPES WITHIN THE LUNGS<sup>1-4</sup>

**47.0%**

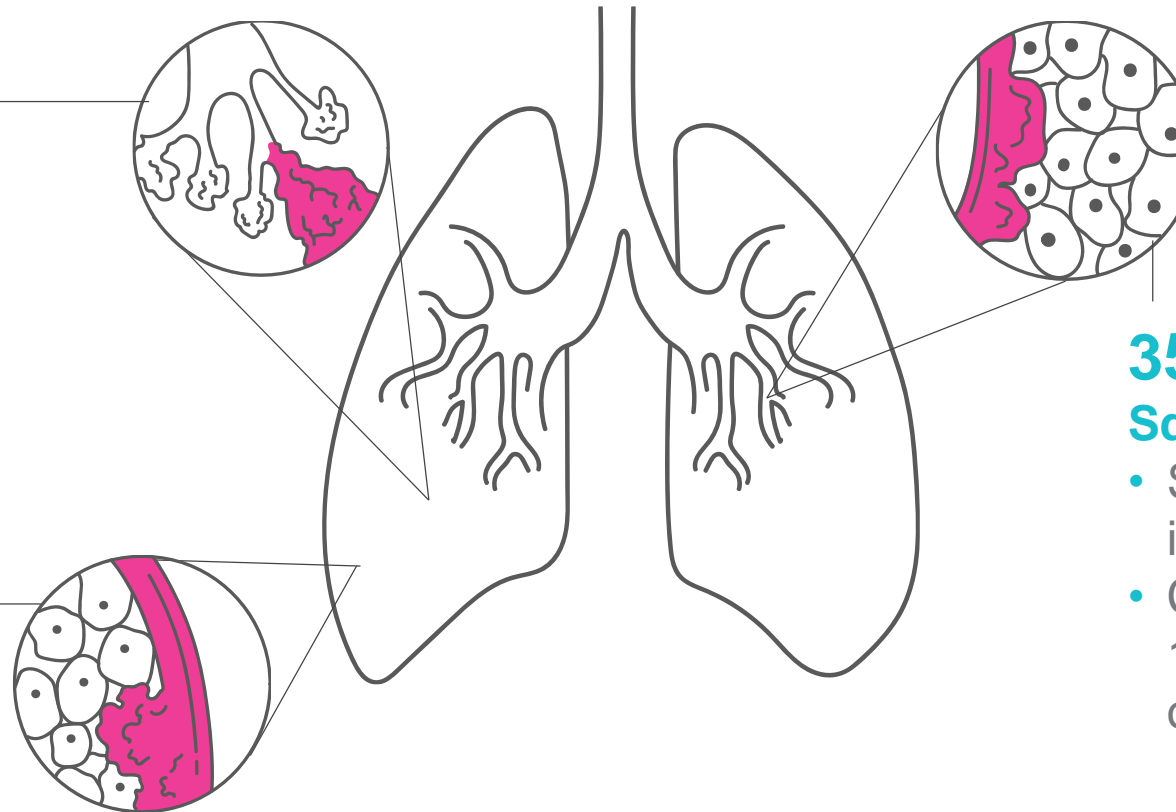
### Adenocarcinoma

- Glandular cells secreting mucus and alveoli
- Outer edges of lungs

**11.7%**

### Large cell carcinoma

- Mostly found in lung periphery



**35.3%**

### Squamous cell carcinoma

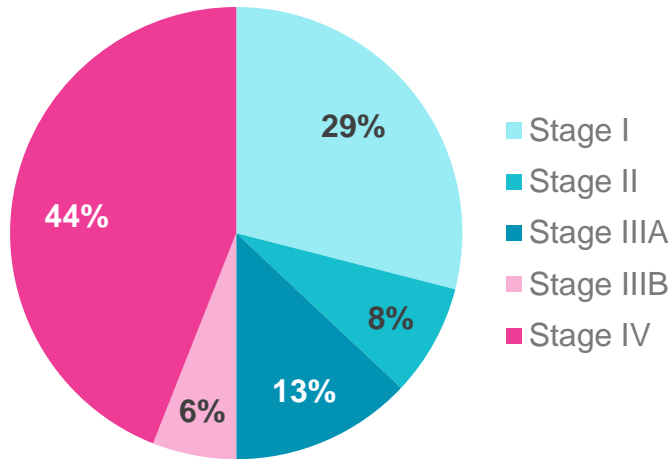
- Squamous cells lining the inside of airways
- Central part of the lung or 1 of the main airways (left or right bronchus)



# NSCLC: Disease Classification and Survival



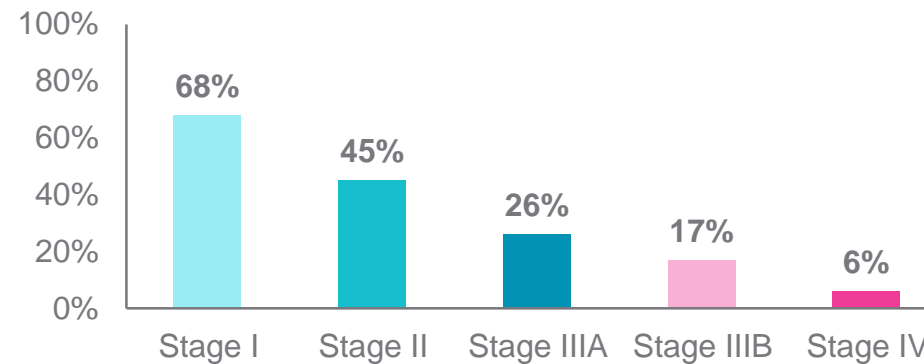
## NSCLC STAGE AT DIAGNOSIS<sup>1,2,\*</sup>



### STAGES OF NSCLC<sup>3</sup>:

- **0:** Primary tumor restricted to the superficial cell layers (localized)
- **I:** Minimally invasive, small tumor ≤4 cm across that has not yet spread
- **II:** Tumor has reached the inner or outer membranes of the lungs or airways, or may have entered lymph nodes within the lung or surrounding area (regional)
- **III:** Partial clogging of the airways and has entered nearby lymph nodes (regional)
- **IV:** Cancer that has spread beyond the point of origin (metastatic)

## FIVE-YEAR RELATIVE SURVIVAL BY NSCLC STAGE AT DIAGNOSIS, 2010–2017<sup>1</sup>



### THE COMMONLY USED STAGING SYSTEM FOR NSCLC IS THE AJCC TNM SYSTEM OF CLASSIFICATION, WHICH IS BASED ON<sup>3</sup>:

Category	Description
Tumor (T)	Size and extent of the main tumor
Nodes (N)	Spread to nearby lymph nodes
Metastasis (M)	Spread of cancer to distant organs

\* Based on 2017 data from the SEER-18 registry.

AJCC, American Joint Committee on Cancer; NSCLC, non-small cell lung cancer; SEER, Surveillance, Epidemiology, and End Results; TNM, tumor, nodes, and metastasis.

1. Ganti AK, et al. JAMA Oncol. 2021; 7(12):1824-1832; 2. Ganti AK, et al. JAMA Oncol. 2021; 7(12):1824-1832, Supplemental Content; 3. Non-Small Cell Lung Cancer Stages. American Cancer Society. <https://www.cancer.org/cancer/lung-cancer/detection-diagnosis-staging/staging-nscl.html> (accessed August 2022).



# NSCLC: Metastatic Disease



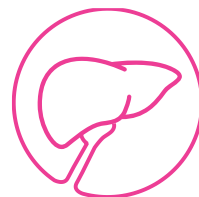
## COMMON METASTATIC SITES OF NSCLC<sup>1,2</sup>:



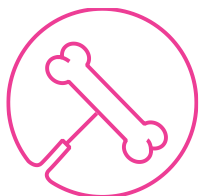
**38.8%**  
Pleural/  
pericardial fluid



**13.3–  
28.4%**  
Brain



**12.2–  
13.4%**  
Liver



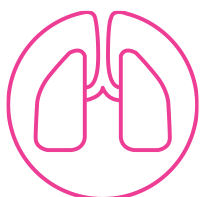
**19.2–  
34.3%**  
Bone



**16.7%**  
Adrenal glands



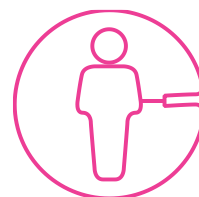
**5.6%**  
Pleura



**32.1%**  
Lungs



**6.5–9.5%**  
Extrathoracic  
lymph nodes



**5.5%**  
Others

Approximately

**50%**

of patients have metastatic NSCLC at diagnosis<sup>1</sup>

More than

**70%**

of patients with metastatic NSCLC are current or former smokers<sup>1</sup>

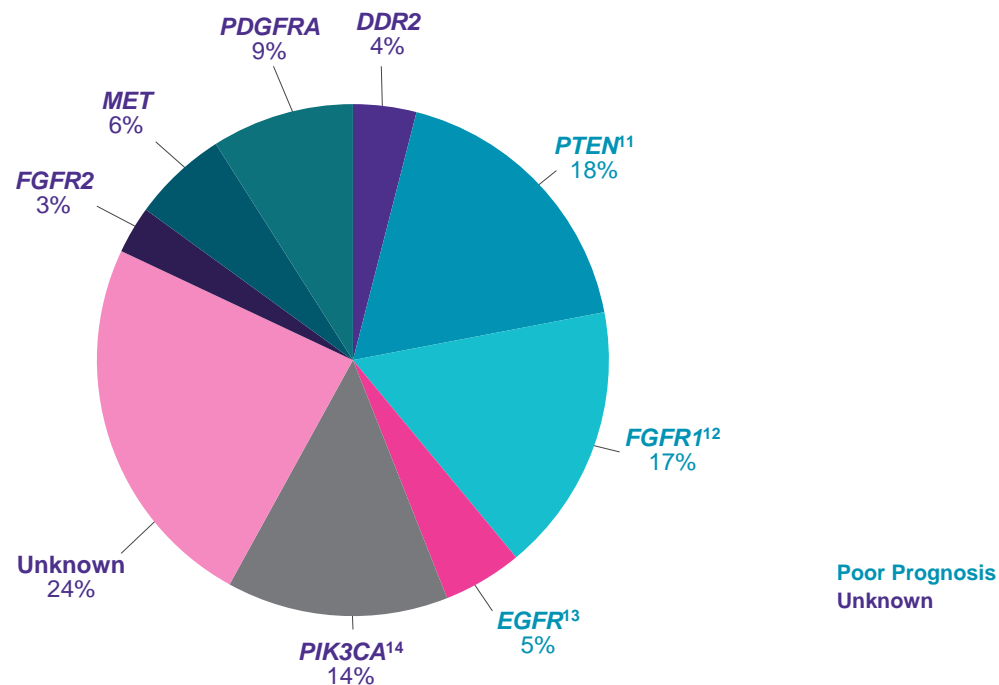
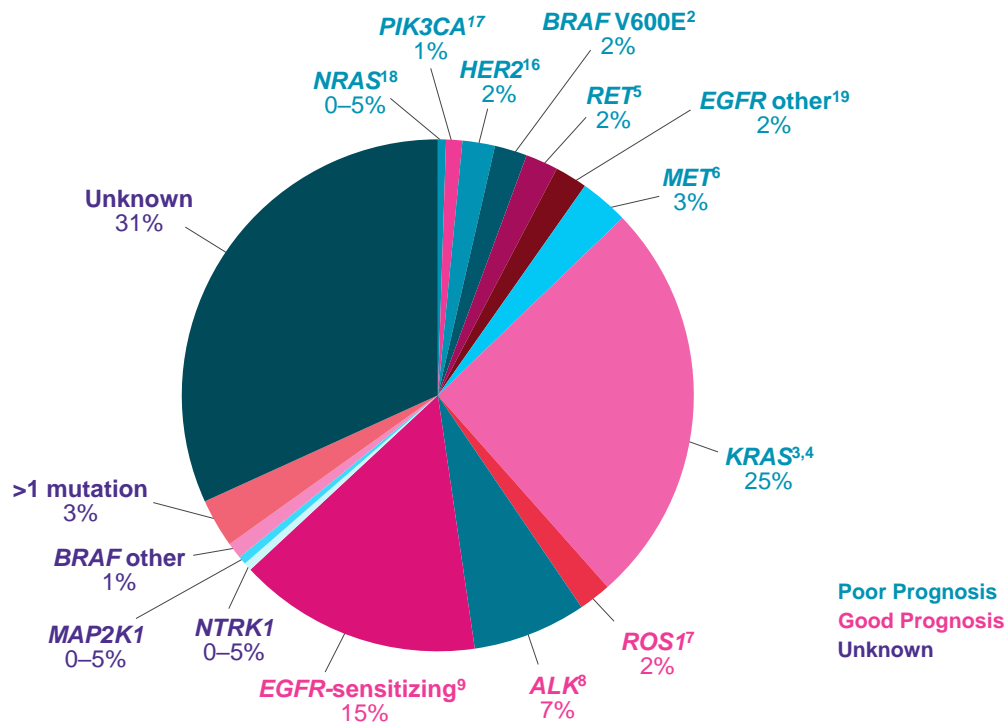


# NSCLC: Oncogenic Drivers



## ONCOGENIC DRIVERS IN ADENOCARCINOMA<sup>1</sup>

## ONCOGENIC DRIVERS IN SQUAMOUS CELL CARCINOMA<sup>1</sup>



About 60% of patients with adenocarcinoma have 1 known oncogenic driver<sup>10</sup>

About 50–80% of patients with squamous cell carcinoma have 1 known oncogenic driver<sup>10</sup>

Oncogenic drivers may serve as prognostic or predictive biomarkers to help guide patient management<sup>15</sup>



NSCLC, non-small cell lung cancer.

1.Types of Lung Cancer. Lungevity. <https://www.lungevity.org/for-patients-caregivers/lung-cancer-101/types-of-lung-cancer> (accessed April 2022); 2. O'Leary CG, et al. Transl Lung Cancer Res. 2019;8(6):1119-24; 3. Svaton M, et al. Anticancer Res. 2016;36(3):1077-82; 4. Finn SP, et al. J Thorac Oncol. 2021;16(6):990-1002; 5. Qiu Z, et al. Sci Rep. 2020 Jun 25;10(1):10387; 6. Tong JH, et al. Clin Cancer Res. 2016;22(12):3048-56; 7. Park S, et al. J Thorac Oncol. 2018;13(9):1373-82; 8. Christopoulos P, et al. Oncotarget. 2019;10(33):3093-103; 9. Li WY, et al. BMC Cancer. 2019;19(1):145; 10. Chan BA, et al. Transl Lung Cancer Res. 2015;4:36-54; 11. Fischer T, et al. Cell Biosci. 2022;12(1):50; 12. Kim HR, et al. J Clin Oncol. 2013;31(6):731-7; 13. Jin R, et al. Front Oncol. 2021;11:680804; 14. Qiu X, et al. Am J Cancer Res. 2021;11(6):3189-200; 15. Ballman KV. J Clin Oncol. 2015;33:3968-71; 16. Wu R, et al. J Thorac Dis. 2021;13(6):3708-3720; 17. Wang L, et al. PLoS One. 2014;9(2):e88291; 18. Zhao J, et al. Onco Targets Ther. 2021;14:1113-1116; 19. Remon J, et al. Cancer Treat Rev. 2020;90:102105.





# NSCLC: NCCN Guidelines<sup>®</sup> Treatment Recommendations and Unmet Need<sup>1</sup>



Treatment modalities can be used alone or in combination depending on NSCLC disease status

Stage	Surgery	Radiation therapy	Chemoradiation	Chemotherapy	Targeted therapy	Immunotherapy*
IA	✓	✓ (definitive) <sup>†</sup>				
IB	✓	✓ (definitive) <sup>†</sup>		✓ (neoadjuvant; adjuvant therapy)	✓ <sup>§</sup>	
II	✓ (additional evaluation may be needed for pathologic disease)	✓ (definitive) <sup>†</sup>	✓ (neoadjuvant or alone)	✓ (neoadjuvant; adjuvant therapy)	✓ <sup>§</sup>	
IIIA N2	✓ (select patients with resectable disease)		✓ (neoadjuvant or alone)	✓ (neoadjuvant; adjuvant therapy)	✓ <sup>§</sup>	
IIIB N3 and IIIC disease			✓			
IV (extensive metastases)		✓ (palliative) <sup>‡</sup>		✓	✓ <sup>  </sup>	✓
IV (limited brain metastasis)	✓	✓ (SRS alone or following surgery)		✓	✓ <sup>  </sup>	✓
IV (metastases; ECOG PS 0–1; negative for actionable mutations)				✓		✓
IV (ECOG PS 2)				✓	✓ <sup>  </sup>	✓

The NCCN Guidelines recommends molecular testing, but strongly advises broader molecular profiling, to identify driver mutations for which targeted therapies may be available to ensure that patients receive the most appropriate treatment<sup>1</sup>

\*As first-line therapy. <sup>†</sup>Patients that are medically inoperable or those that refuse surgery. In patients upstaged to N2+ after surgery, postoperative chemotherapy is an option followed by postoperative radiation therapy. <sup>‡</sup>Symptom relief and potentially for prophylaxis at primary or distant sites (such as pain, bleeding, or obstruction). <sup>§</sup>Select EGFR inhibitors are recommended for patients with completely resected stage IB–IIIA EGFR (exon 19 deletion, L858R) NSCLC who received previous adjuvant chemotherapy or are ineligible to receive platinum-based chemotherapy. <sup>||</sup>Suitable targeted therapy following NCCN<sup>®</sup> recommended molecular testing. ECOG PS, Eastern Cooperative Oncology Group Performance Status; EGFR, epidermal growth factor receptor; NCCN, National Comprehensive Cancer Network<sup>®</sup> (NCCN<sup>®</sup>); NSCLC, non-small cell lung cancer; QoL, quality of life; SRS, stereotactic radiosurgery.

1. Adapted with permission from the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines<sup>®</sup>) for Non-Small Cell Lung Cancer V.5.2022. © 2022 National Comprehensive Cancer Network, Inc. All rights reserved. The NCCN Guidelines<sup>®</sup> and illustrations herein may not be reproduced in any form for any purpose without the express written permission of NCCN. To view the most recent and complete version of the NCCN Guidelines, go online to NCCN.org. The NCCN Guidelines are a work in progress that may be refined as often as new significant data becomes available.





# NSCLC: Quality of Life



- Late detection of the disease results in poor life expectancy<sup>1</sup>
- Factors such as stage IV disease, line of treatment, and progressive disease significantly impact HRQoL<sup>2</sup>
- Psychological distress, associated comorbidities, older age, and living alone significantly impact the HRQoL, wellbeing, and family functioning of people with NSCLC<sup>3</sup>
- Patients experience disease-related symptoms, such as fatigue, pain, dyspnea, anorexia, and cough<sup>4</sup>
- Palliative care plays a major role in treatment strategy for patients with advanced disease, who often have significant disease-related symptoms and poor quality of life<sup>5</sup>