Environmental injury

By chemical agents

By physical agents:

Mechanical

Thermal & electrical

Ionizing radiation

By biological agents:

Virus, fungi, bacteria, pollen

Chemical agents

Air-, soil- and water-contamination

Environmental pollution

Tobacco smoke

Occupational injury

Alcohol and other drogs of abuse

Therapeutic agents

Smoking….

….is disgusting for eyes, hateful for nose, harmful for brain, dangerous for lung and its stinky black smoke is similar to flume of the hell.

1st Jacob, XVIIth century

Effects of selected tobacco smoke constituents **1st**

• Tar	**carcinogenesis**
• Polycyclic aromatic CHs	**carcinogenesis**
• Nicotine	ganglion stim. and depr., **tumor promotion**
• Phenol	**Tumor prom.** and irritation

2nd

• Benzopyrene	**Carcinogenesis**
• CO	Impaired O2 transport and utilisation
• Formaldehyde	Toxic to cilia and irritation
• NO2	same
• Nitrosamine	**Carcinogenesis**

- the **burning** cigarette contains 4000 different compounds
- 3-400 of them have carcinogenous effects based on the mutation of **p53 gene** and the production of **free radicals**
- one cigarette smoked makes the lifetime **5.5 minutes shorter**

The risk of lung cancer is directly related to the number of cigarettes smoked

30 (p~y)

Nicotine stimulates the release of noradrenaline (NA)

- **NA results in high blood pressure, elevated heart rate and cardiac output**

CO reduces O_2 - binding capacity of blood and the blood flow

High cholesterol level

Abnormal thromboxane synthesis and prostacyclin cause damage of endothelial cells

Cigarette smoking and….1st
in alphabetical order

- **atherosclerosis**
- bladder cancer
- **cancer of oral cavity**
- **chronic bronchitis**
- **emphysema**
- esophageal carcinoma
- intrauterine growth retardation

Cigarette smoking and…2nd

- **ischemic heart disease**
- **laryngeal carcinoma**
- **leukoplakia**
- **lung cancer**
- pancreatic cancer
- peptic ulcer
- renal cell carcinoma
- vulvar carcinoma

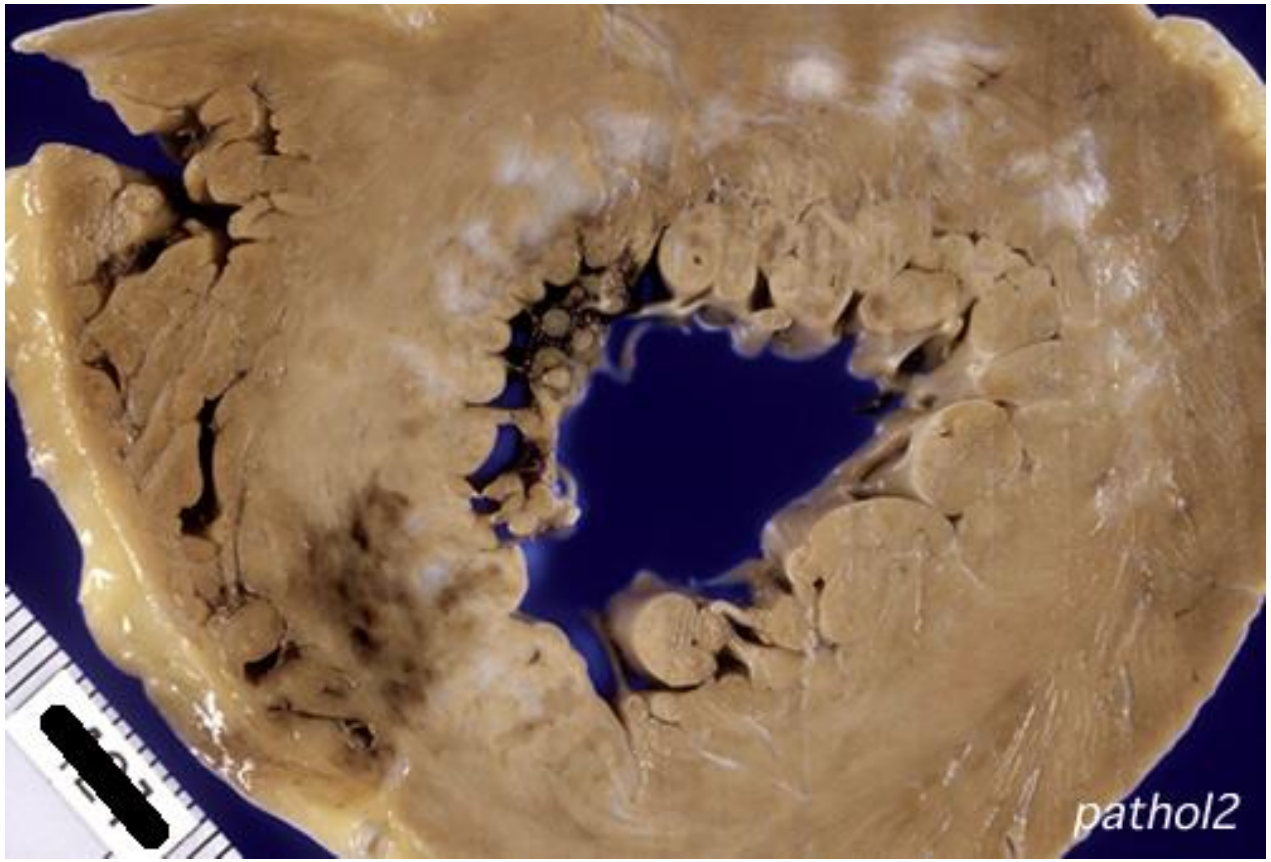
Cardiovascular diseases

Cigarette smoking is a major risk for **AMI**

- acts synergically with other risk factors - high blood pressure + elevated cholesterol level
- increases the incidence of sudden cardiac death
- dose-related effect

Exposure to cigarette smoke activates a number of mechanisms predisposing the atherosclerosis, including 1.thrombosis, 2.insulin resistance and 3.dyslipidemia, 4.vascular inflammation, 5.abnormal vascular growth and angiogenesis, as well as 6.loss of endothelial homeostatic and regenerative functions.

Myocardial infarction

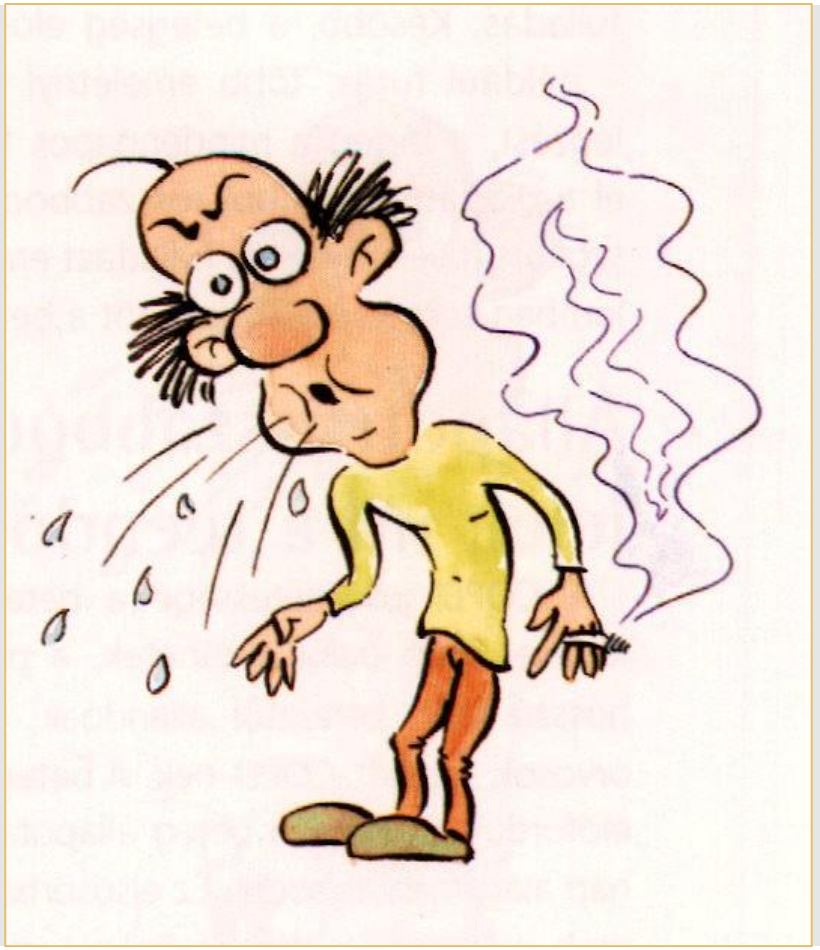


Respiratory System

COPD

- **Chronic bronchitis**
- **Emphysema**

Lung Cancer



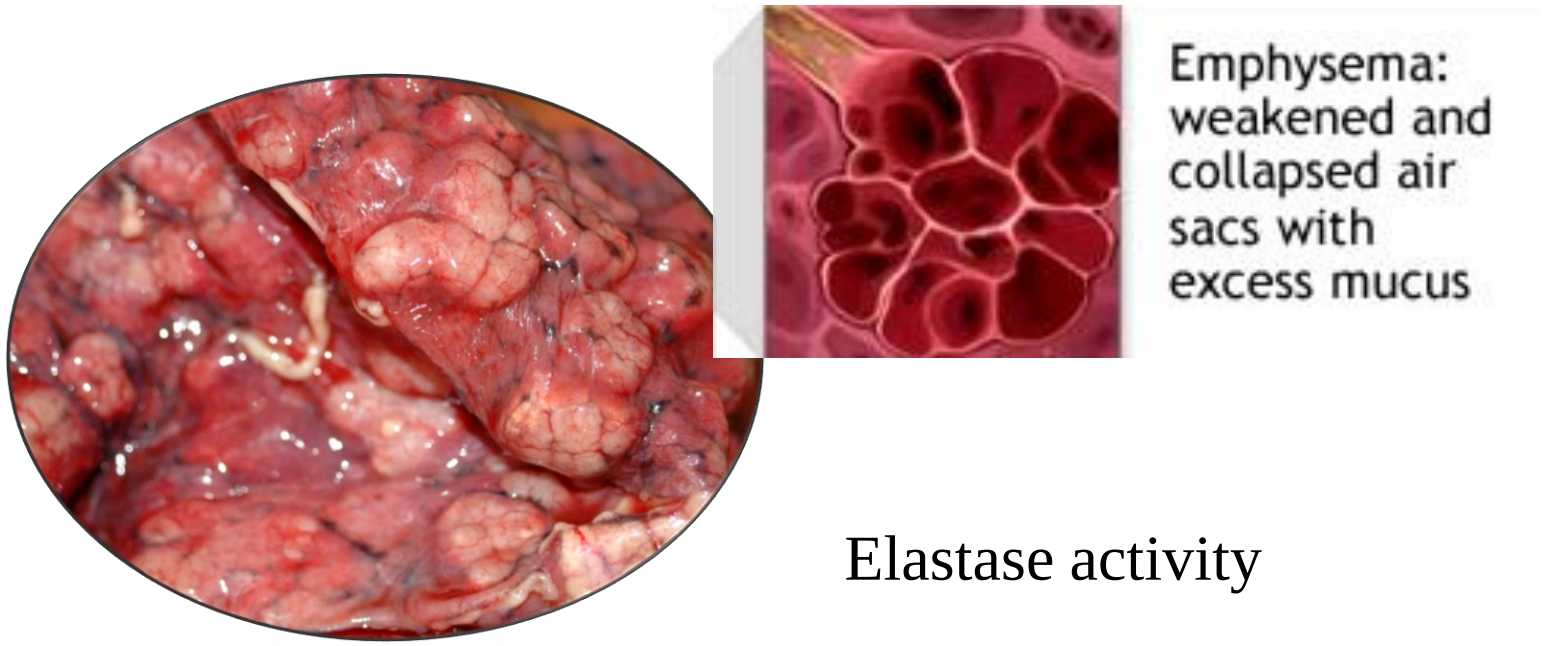
Chronic Bronchitis

- **Diagnosis:** persistent cough with sputum for 3 months in 2 consecutive years

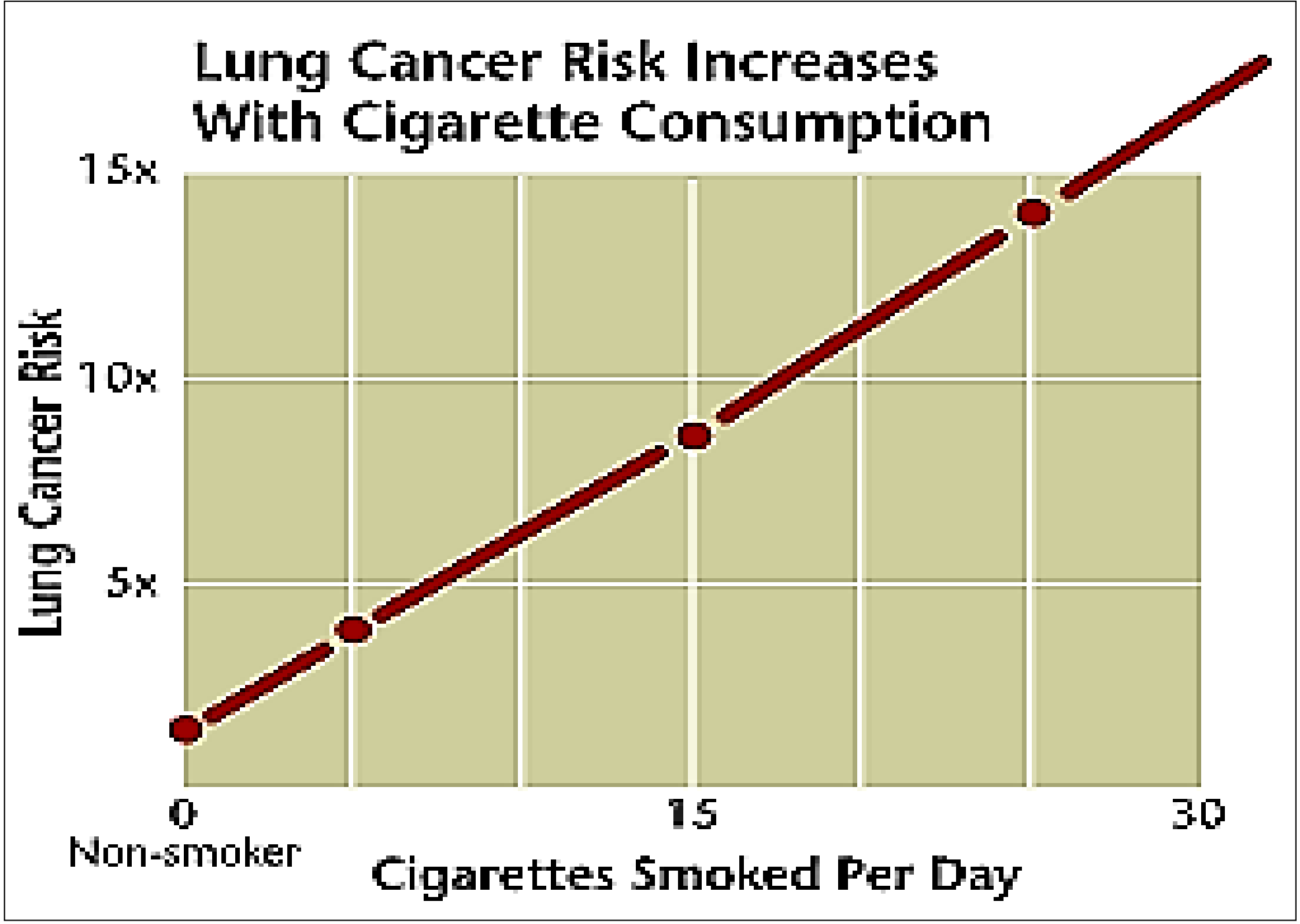
- **Simple** bronchitis: mucoid sputum wo obstruction
- Intermittant bronchial spasmus
- **Chronic obstructive** bronchitis w emphysema (heavy smokers)

Emphysema

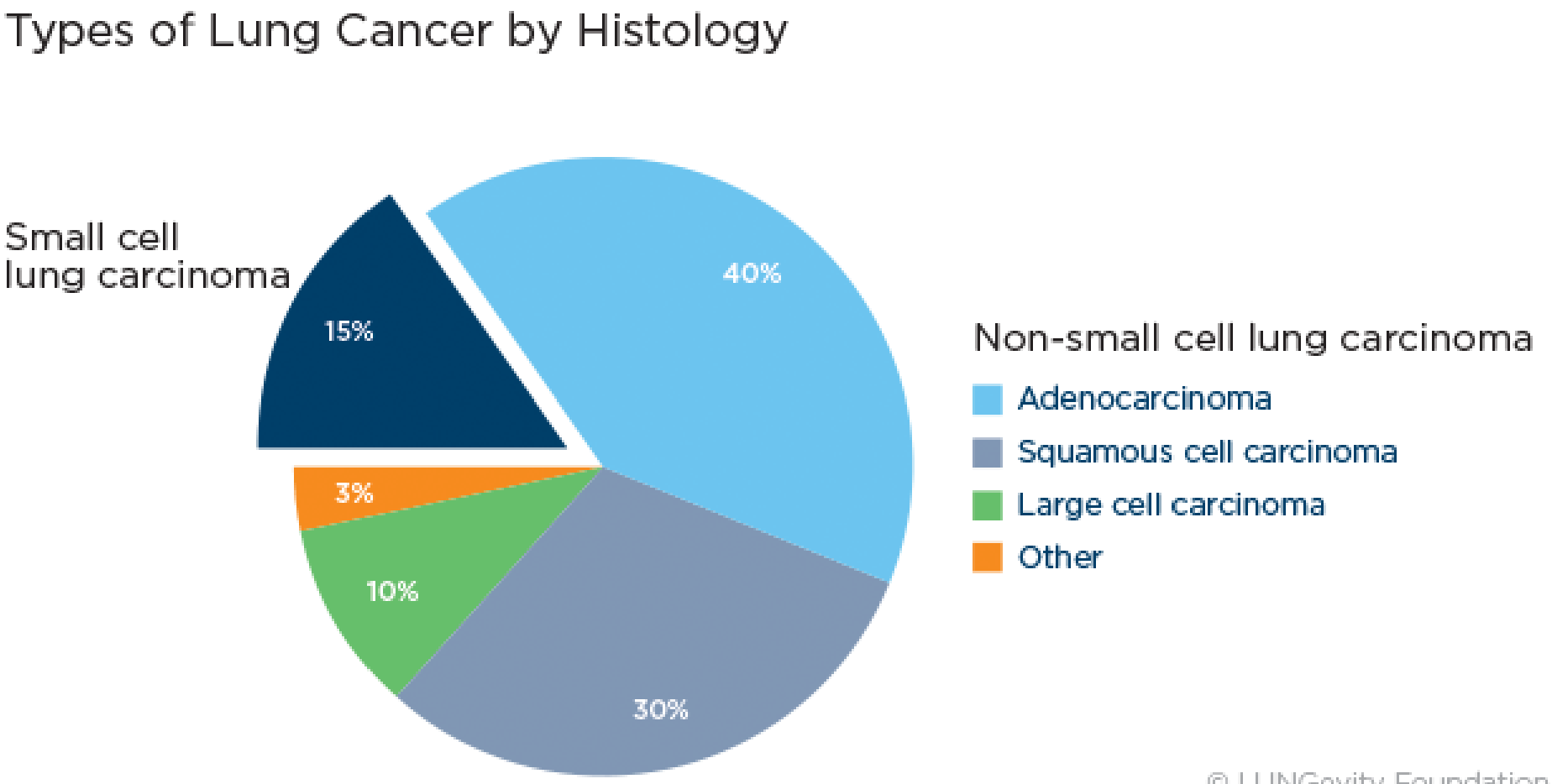
- Permanent acinar and airspace enlargement distal to terminal bronchiole **with tobacco related** wall destruction



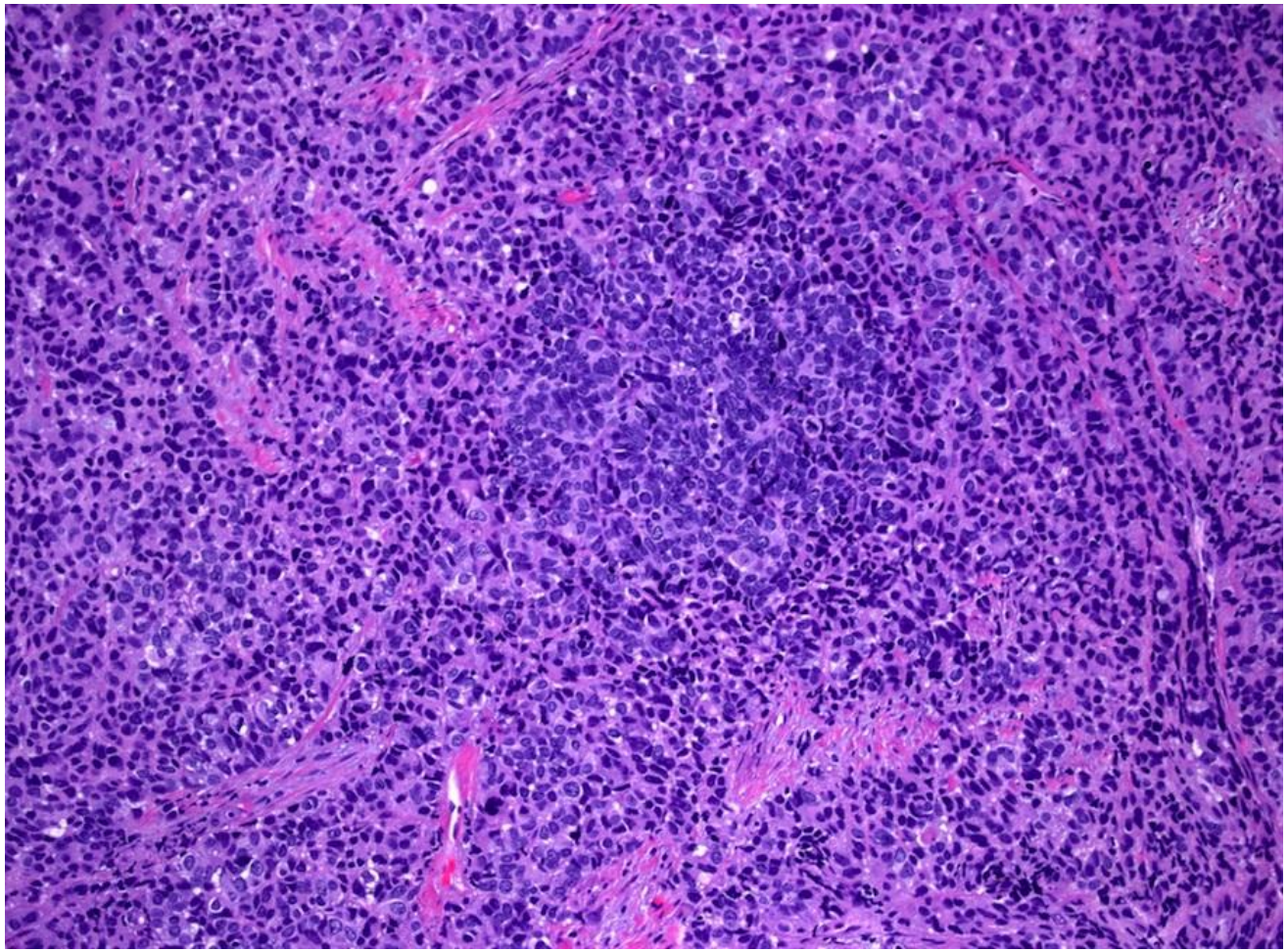
Elastase activity


Lung Cancer Risk Increases
With Cigarette Consumption
15x
10x
5x
Lung Cancer Risk
0
Non-smoker
15
30
Cigarettes Smoked Per Day

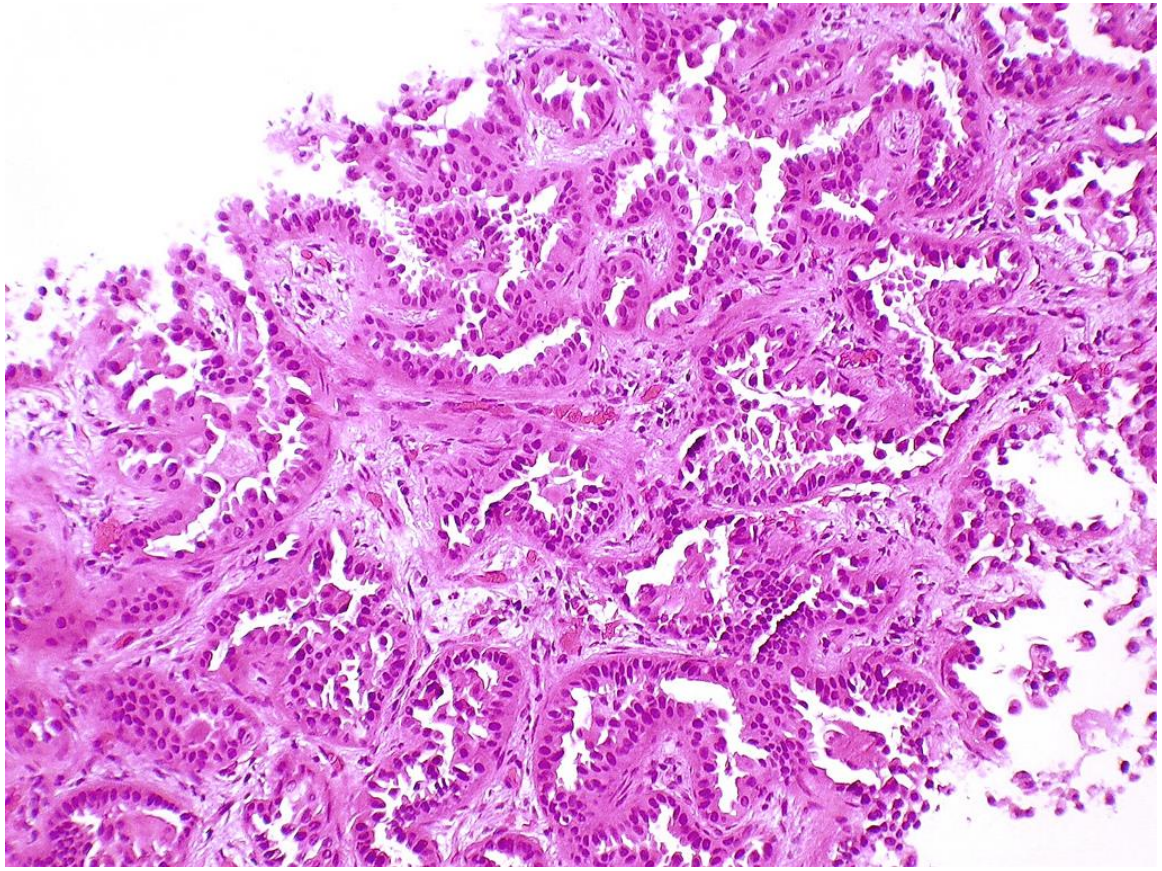
Lung Cancer



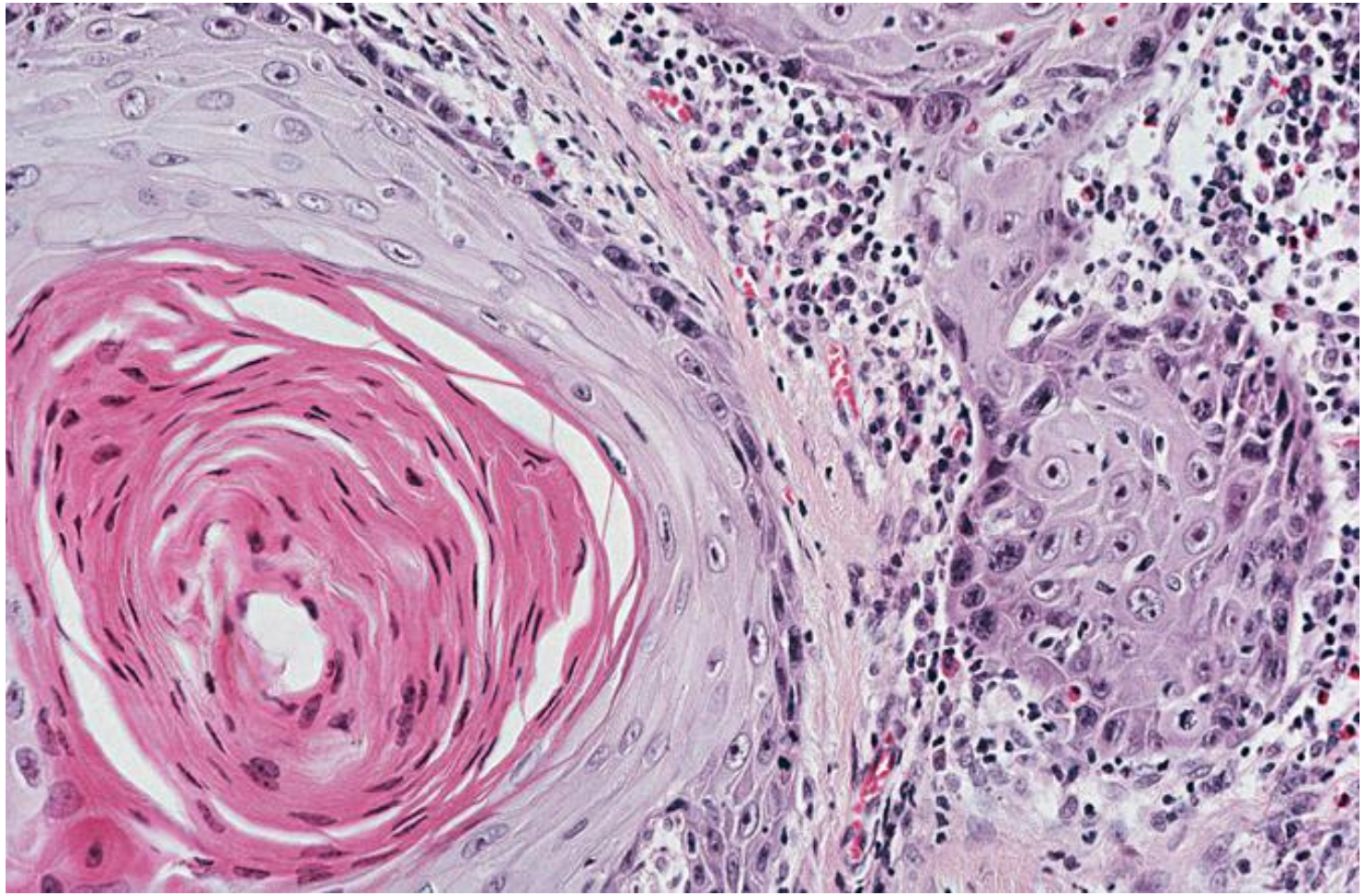
Small Cell Lung Cancer 15%



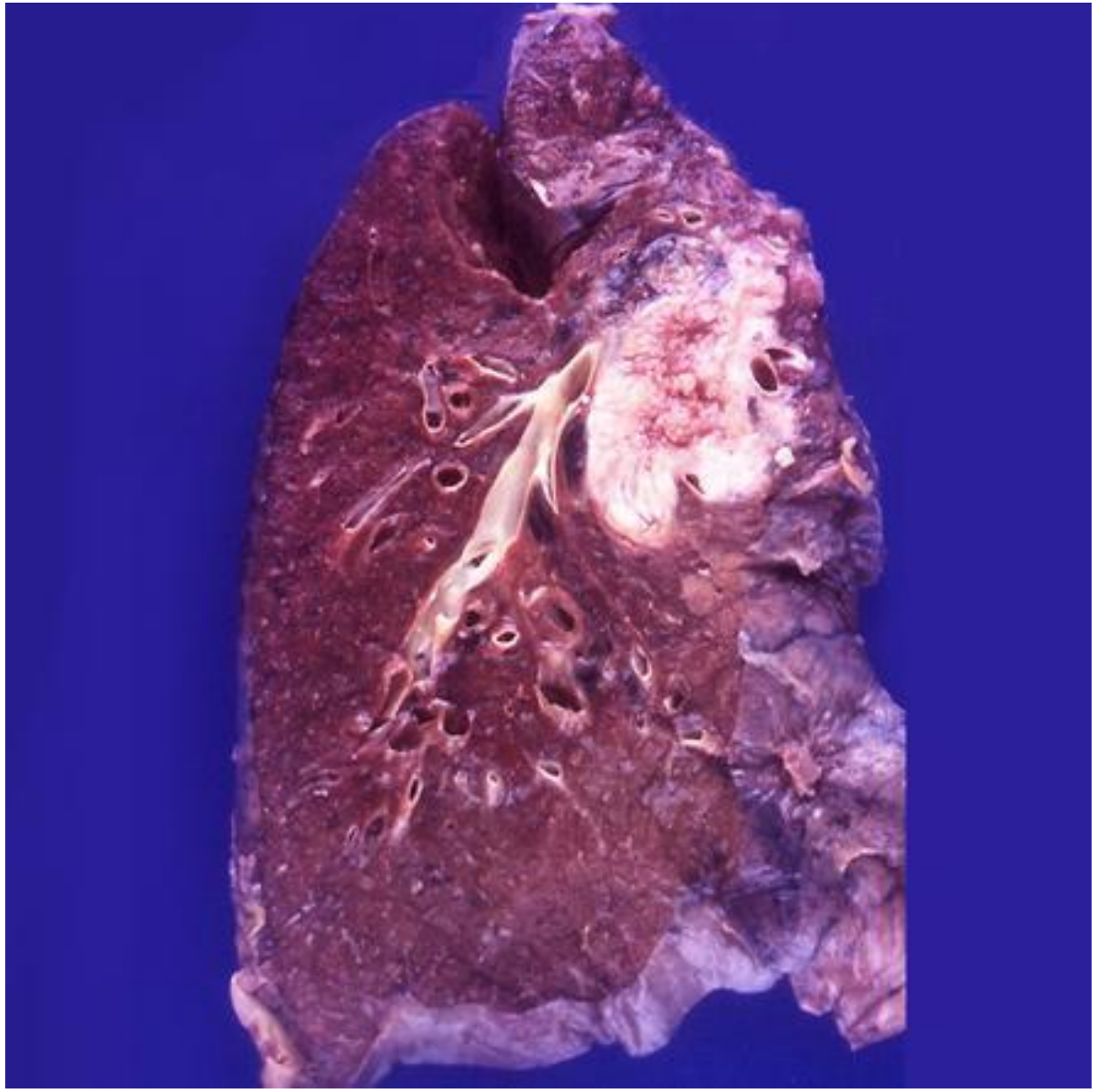
Non-Small Cell Lung Cancer
Adenocarcinoma 40%



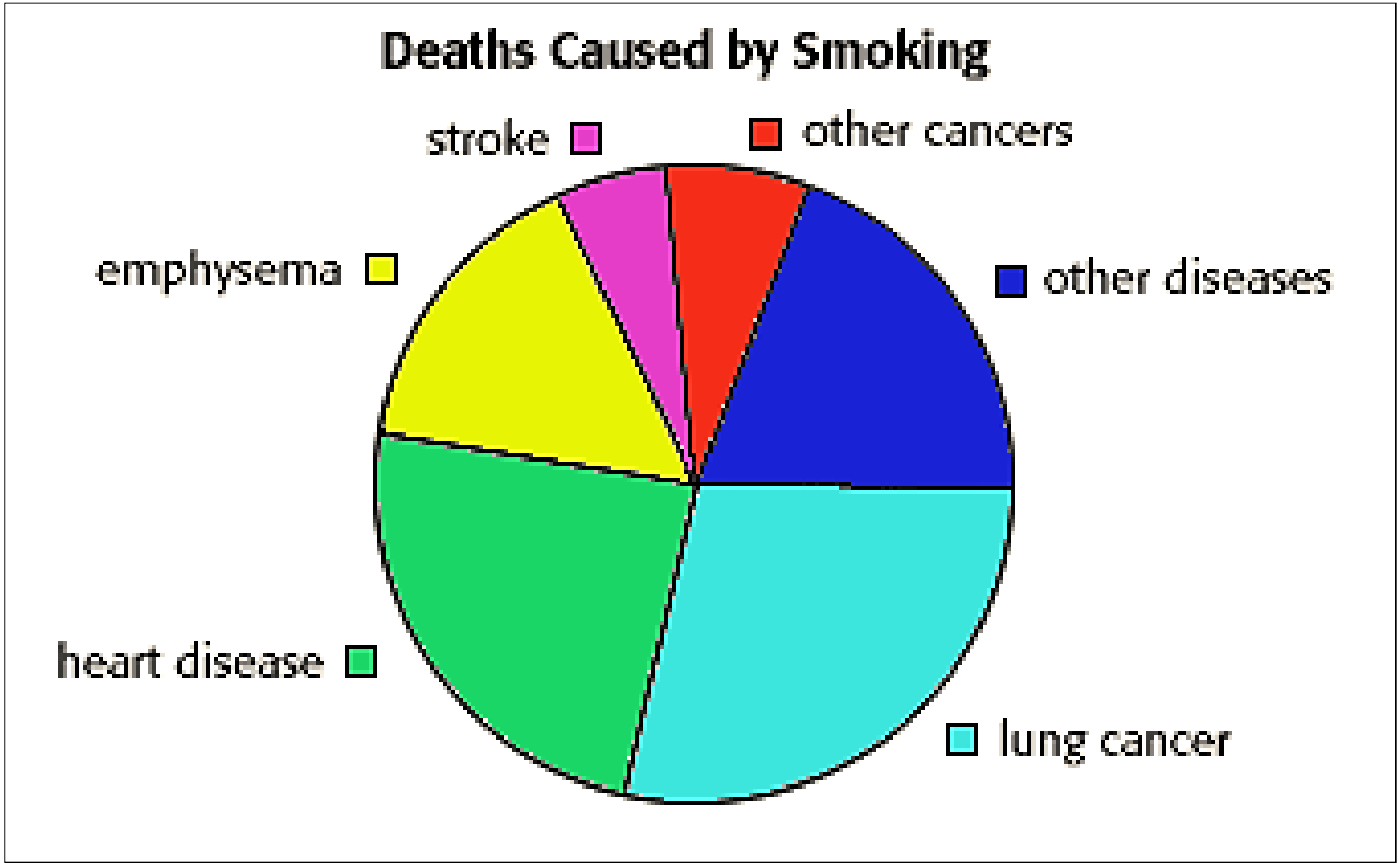
Non-Small Cell Lung Cancer
Squamous Cell Carcinoma 30%



endoscopy



surgery


Deaths Caused by Smoking
stroke
other cancers
emphysema
other diseases
heart disease
lung cancer

women and smoking…

- earlier menopause and osteoporosis
- pregnancy - „small for date babies”
- perinatal mortality
- placental insufficiency

Review Article: Ulcerative Colitis, Smoking and Nicotine Therapy

P. C. Lunney; R. W. L. Leong

DisclosuresAliment Pharmacol Ther. 2012;36(11):997-1008.