Death rates from lung cancer in USA
Smoking represents an interesting combination of an entrenched industry and a clearly drug-induced cancer.
Tobacco Use in the US, 1900-2000

*Age-adjusted to 2000 US standard population.

*Smoked cigarettes on one or more of the 30 days preceding the survey.
Staging of lung cancer

**FIGURE 30.2-7.** New International Staging System (ISS). (A) Categories of stage I disease. (B) Categories of stage II disease. (C) Categories of stage IIIA disease. (D) Categories of stage IIIB disease. (Mountain CF. A new international staging system for lung cancer. Chest 1986;89:225S)
**Staging is essential for determining prognosis**

### TABLE 30.2-5. TNM Staging System for Lung Cancer; Including Proposed Changes

#### TNM DEFINITIONS

**Primary Tumor**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Descriptors</th>
<th>5-Year Survival Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>T1–2, N0, M0</td>
<td>60–80</td>
</tr>
<tr>
<td>II</td>
<td>T1–2, N1, M0</td>
<td>25–50</td>
</tr>
<tr>
<td>IIIA</td>
<td>T3, N0–1, M0</td>
<td>25–40</td>
</tr>
<tr>
<td></td>
<td>T1–3, N2, M0</td>
<td>10–30</td>
</tr>
<tr>
<td>IIIB</td>
<td>Any T4 or any N3, M0</td>
<td>&lt;5</td>
</tr>
<tr>
<td>IV</td>
<td>Any M1</td>
<td>&lt;5</td>
</tr>
</tbody>
</table>

**Regional Lymph Node Involvement**

- N0: No involvement
- N1: Ipsilateral bronchopulmonary or hilar
- N2: Ipsilateral or subcarinal mediastinal
- N3: Ipsilateral supraclavicular nodes
- N3: Contralateral mediastinal hilum or supraclavicular

**Metastatic Involvement**

- M0: None
- M1: Metastases present

**CURRENT SYSTEM**

- I: T1–2, N0, M0: 60–80
- II: T1–2, N1, M0: 25–50
- IIIA: T3, N0–1, M0: 25–40
- IIIA: T1–3, N2, M0: 10–30
- IIIB: Any T4 or any N3, M0: <5
- IV: Any M1: <5

**PROPOSED CHANGES (UICC AND AJCC)**

- Ia: T1, N0, M0: >70
- Ib: T2, N0, M0: 60
- IIa: T1, N1, M0: 50
- IIb: T2, N1, M0: 50
- IIIa: T3, N0–1, M0: 40
- IIIa: T1–3, N2, M0: 10–30
- IIIb: Any T4, any N3, M0: <10
- IV: Any M1: <5
- IV: Any M1: <2
Types of lung cancer:

Non-small cell lung cancer (NSCLC)
1. Squamous cell carcinoma
2. Adenocarcinoma
3. Large cell carcinoma

Small cell lung cancer (SCLC) (a.k.a. oat cell carcinoma)

Other lung cancers:
mesotheliomas, metastases from other primary tumors
Fig. 12.8 Five-year relative survival from non-small-cell lung cancer.
Normal lung
Histology of normal lung
X-ray and dissected tumor: large squamous cell carcinoma
X-ray and tumor: squamous cell carcinoma extending to pleura
This is a squamous cell carcinoma of the lung that is arising centrally in the lung (as most squamous cell carcinomas do). It is obstructing the right main bronchus.
This is the microscopic appearance of squamous cell carcinoma, with nests of polygonal cells with pink cytoplasm and distinct cell borders.
The pink cytoplasm with distinct cell borders and intercellular bridges characteristic of a squamous cell carcinoma are seen here at high magnification.
In this squamous cell carcinoma at the upper left is a squamous eddy with a keratin pearl. At the right, the tumor is less differentiated and several dark mitotic figures are seen.
This is a peripheral adenocarcinoma of the lung. Adenocarcinomas and large cell anaplastic carcinomas tend to occur more peripherally in lung. Adenocarcinoma is the one cell type of primary lung tumor that occurs more often in non-smokers and in smokers who have quit. If this neoplasm were confined to the lung (a lower stage), then resection would have a greater chance for cure. The solitary appearance of this neoplasm suggests that the tumor is primary rather than metastatic.
Arising centrally in this lung and spreading extensively is a small cell anaplastic (oat cell) carcinoma. The cut surface of this tumor has a soft, lobulated, white to tan appearance. The tumor seen here has caused obstruction of the main bronchus to left lung so that the distal lung is collapsed. Oat cell carcinomas are very aggressive and often metastasize widely before the primary tumor mass in the lung reaches a large size.
Here is an oat cell carcinoma which is spreading along the bronchi. The speckled black rounded areas represent hilar lymph nodes with metastatic carcinoma. These neoplasms are more amenable to chemotherapy than radiation therapy or surgery, but the prognosis is still poor. Oat cell carcinomas occur almost exclusively in smokers.
This is the microscopic pattern of a small cell anaplastic (oat cell) carcinoma in which small dark blue cells with minimal cytoplasm are packed together in sheets.
The dense white encircling tumor mass is arising from the visceral pleura and is a mesothelioma. These are big bulky tumors that can fill the chest cavity. The risk factor for mesothelioma is asbestos exposure. However, mesothelioma is rare even in persons with asbestos exposure. Asbestosis more commonly predisposes to bronchogenic carcinomas, increasing the risk by a factor of five. Smoking increases the risk for lung cancer by a factor of ten. Thus, smokers with a history of asbestos exposure have a 50-fold greater likelihood of developing lung cancer.
The asbestos fiber becomes coated with iron and calcium, which is why it is often referred to as a "ferruginous body" as seen here with an iron stain. Ingestion of these fibers by macrophages sets off a fibrogenic response via release of growth factors that promote collagen deposition by fibroblasts.
Fig. 12.5 Local and metastatic spread in lung cancer.
X-ray and gross pathology of metastatic tumors of the lung
X-ray and gross pathology of metastatic tumors of the lung
A focus of metastatic carcinoma from breast is seen on the pleural surface of the lung. Such pleural metastases may lead to pleural effusions, including hemorrhagic effusions, and pleural fluid cytology can often reveal the malignant cells.
A nest of metastatic infiltrating ductal carcinoma from breast is seen in a dilated lymphatic channel in the lung. Carcinomas often metastasize via lymphatics.