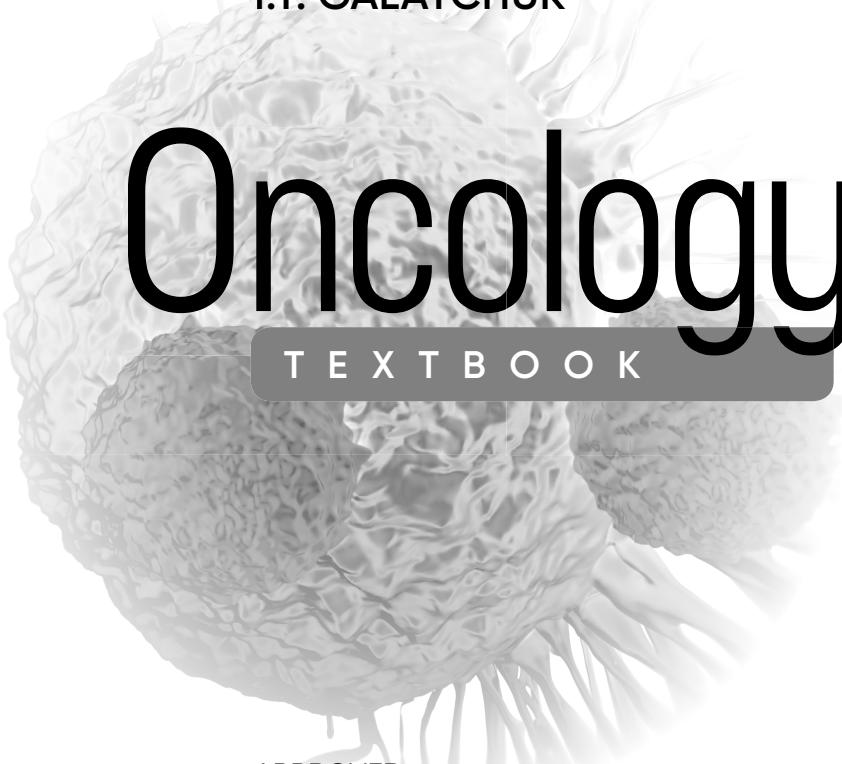


**V.I. STARIKOV  
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# Oncology

TEXTBOOK

APPROVED  
by the Academic Council of Kharkiv National  
Medical University and is recommended for  
the fifth- and sixth-year students of medical  
faculties

**Kyiv  
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The first part of the textbook examines the issues of general oncology, aetiology, pathogenesis of malignant tumours, as well as the basic principles of diagnosis and treatment of cancer patients. In the second part 16 cancer localisations, risk factors, diagnostics, classification and treatment are considered.

The textbook is intended for English-speaking fifth- and sixth-year students of Ukrainian higher medical education establishments.

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## **Introduction**

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Malignant tumours are the second only to heart and vessel diseases as a cause of death in the most highly developed countries. However, the existing tendency of malignant neoplasms to increase makes it possible to predict that malignant tumours will be the main cause of population death throughout the world, so we can say that the problem of malignant neoplasms is not only medical, but also a social one.

A rapid increase in the incidence of malignant tumours of almost all localisations was recorded at the end of the 20<sup>th</sup> and the beginning of the 21<sup>st</sup> centuries.

Moreover, the incidence of the most frequent localisations (lung, breast, skin, prostate and uterine body) of malignant tumours has been constantly increasing.

It happens because of the ruinous influence of carcinogenic factors on the human body. Different pathogenic factors: chemical, physical and biologic cause malignant cell transformation.

Cancer has been known to be widespread in multicellular plants, insects, birds. This ancient disease is much older than man.

Scientific and technical progress has induced the explosive growth of knowledge and thus the possibility to study tumours at the cell genome level.

This textbook has been aimed at partial presentation of general aspects about carcinogenesis and treatment modalities, since it is recommended first of all for the students of medical universities studying a course of oncology. The textbook can be helpful to young medical specialists: oncologists, surgeons, therapeutists and students of biological faculties.

## Part I

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### GENERAL ONCOLOGY

**Oncology** is the science that deals with tumours, discloses the causes and establishes general regularities of their origin (etiology) and the mechanism of their pathogenesis, preventive measures, diagnosis and treatment.

Oncology, as a general biological problem, is closely connected with different branches of natural sciences: molecular cell biology, social hygiene and ecology.

Oncology is a branch of medical science that studies a definite scientific problem. Specialisation according to problems is very up-to-date and promising, as it makes it possible to use different methods of research and treatment. Over the last years, it has begun to develop into oncogynaecology, mammology, otolaryngological oncology, thoracal oncology, abdominal oncology, oncourology, oncoproctology, oncopaediatry, drug therapy etc.

A simplified definition of malignant tumour is as follows: tumour is unlimited growth of tissue with loss of its differentiation (plus tissue, minus differentiation). But sometimes, this definition is not true, because in some cases, tumour growth and healthy tissue destruction are observed, but there is no increase in the size of the tissue or organ.

A tumour grows from a primary neoplastic bud and does not involve the surrounding unchanged cells in the process. Infiltrative growth and metastasising are characteristic of malignant tumours. It is characterised by unlimited and relatively autonomous growth and duplication of cells in the focus of the disease.

Tumours, especially malignant tumours, are accompanied by changes throughout the body.

We will give a definition of malignant tumour and point out only its main biologic properties.

A **malignant tumour** is a biologic tissue with unlimited proliferation of transformed cells, losing morphologic parameters of histogenesis and capable of dissemination and implantation into other tissues and formation of new foci of tumour growth.

**Benign tumour** is characterised by higher cell differentiation, slow non-infiltrative growth and absence of metastasising.

## **Part I. General Oncology**

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The names of different tumours are usually formed from those of the tissue, from which the tumours are derived (cell, tissue, organ) and the suffix **-oma**, which means “tumour”. For example, fat tissue tumour — **lipoma**, bone tissue tumour — **osteoma**, glandular tissue tumour — **adenoma**. The name of the tumour may indicate cell structure (e. g., tumour developing from histocytes is called **histocytoma**). Also, the site of the tumour may be indicated in the tumour name (e. g., shoulder lipoma, breast fibroadenoma). Tumour containing elements of embryonal tissue is called embryoma or teratoma.

Tumour may be derived from the epithelial, connective, nervous and muscle tissue.

There are special names for malignant tumours — carcinoma or **cancer** for tumours derived from the epithelial tissue and **sarcomas** for those derived from the connective tissue. About 90 % of all malignant solid tumours in adults are cancers, and about 10 % are sarcomas. In children, everything is vice versa, sarcomas account for 90 % of all solid tumours and cancers account for less than 10 %.

Systemic tumours of the haemopoietic tissue are called **haemoblastoses**. There is a small group of tumours called **herminogenic**, they are tumours from the testicles and ovaries.

### **Epidemiology of Malignant Tumours**

Epidemiology is a branch of oncology studying variations in disease incidence in population groups. It identifies cancer risk in populations, the rate of affected and dead patients from malignant tumours for a certain period of time on a specific territory and applies preventive measures.

It has been estimated that about 90 % of all malignant tumours are due to environmental factors (exogenous), the rest 10 % are caused by genetic factors, hormones and viruses (endogenous).

It has been proved that malignant tumours have been registered in every nationality and ethnic group. However, the geographic and ethnic differentials for most cancers appear largely determined by environmental influences. Rates for stomach cancer in different countries vary greatly in line with socioeconomic differences in the use of alcohol and tobacco and nutritional patterns. The Japanese, Icelanders, Chileans experience elevated rates for stomach cancer. Americans, Indonesians and Egyptians have low rates of this disease. These variations in cancer occurrence can be explained by genetic and dietary factors.

Correlation of microelements in the soil and drink water are of great importance.

Some regions have exceptionally high rates of certain cancers. Africans have high rates for Burkitt's lymphoma. African populations experi-

ence elevated rates for primary liver cancer in comparison with American or European populations.

There are two main methods of malignant tumour epidemiologic investigations. They are **descriptive** and **analytic** studies.

**Descriptive studies** measure the number of persons affected by the disease, the length of the period covered and the population from which they are derived. These studies can be useful in generating aetiological hypotheses. Cancer shows variations according to age, sex, race, geographic location, socioeconomic class and marital status. Descriptive studies employ mainly population-based statistics on mortality, incidence and survival to calculate rates.

**Analytic studies** test aetiology hypotheses, involving cohort or case-control designs. These studies allow estimating the risk of disease associated with exposure. Retrospective and prospective analyses are used in these studies.

The incidence and death rates according to sex are of great interest in the epidemiology of malignant tumours. In males, malignant tumour incidence (cancer of the lung, stomach, larynx, oral cavity and oesophagus) is higher than in females. In females, malignant tumour incidence in the thyroid gland, liver and gallbladder is higher than in males.

Most often, the incidence and death rates are expressed in new registered cancer cases calculated per 100,000 population. Incidence rates may be crude (for all ages) or age-specific (standard). When summary figures are necessary to compare rates between population groups with different age distribution, they should be age-adjusted; this is done by multiplying each age-specific rate by the percent of individuals in a standard population with the same age and then summing to produce a single value.

For several cancers with poor survival, mortality rates nearly equal incidence rates. The combined analyses of incidence, mortality and survival statistics provide valuable data on the patterns of cancer. There are European, world and other standards.

According to the registered data, a crude incidence rate of malignant tumours has increased in Ukraine to 375.7 cases per 100,000 population in 2015; in comparison with 2005 it was 348.0 cases.

The incidence rate has increased for oral cavity, lung, colon and rectum, skin, breast, uterine body, prostate, bladder, thyroid cancers. Incidence rates have risen the most for malignant tumours of the thyroid — 40 %, skin — 26 %, prostate — 25.4 % in comparison with 1997. Notable declines are apparent for lip, oesophagus, stomach and larynx cancers.

The rank of different cancers in male and female in Europe and Ukraine is different (see the Fig. 1, 2 on the colour inset). The crude incidence rate of malignant tumours in Ukrainian males is 349.1 per 100,000 population, in females — 304.1 per 100,000.