

Basics of oncology - Terminology

Definition of oncology:

Oncology is a specialized field of medicine and deals with the prevention, diagnosis, treatment and aftercare of cancer.

Definition cancer:

Cancer is a malignant new tissue formation/tumor, also known as **neoplasia** (uncontrolled growth). Degenerated cells multiply uncontrollably, grow into neighboring tissue and thus destroy healthy tissue. They can also form metastases that are distributed throughout the body via the lymphatic system or bloodstream and can form daughter tumors.

Diagnosis in oncology is carried out using, among other things, imaging procedures such as ultrasound, MRI or CT. In addition, tissue samples (biopsies) can be taken and laboratory tests or molecular genetic tests can be carried out.

Various treatment options are available for therapy.

- Surgical therapy – removal of the growth/tumor through a surgical procedure
- Radiation therapy (radiotherapy) – here the tumor tissue is destroyed using ionizing radiation
- Systemic therapy – this refers to drug treatment with chemotherapy, immunotherapy, hormone therapy and/or monoclonal antibody therapy or targeted therapy. To alleviate side effects, these therapies can be accompanied by supportive therapies that can maintain or improve quality of life.

After therapy has been completed, **aftercare** begins. Various types of examinations are carried out here at regular intervals in order to detect any recurrence at an early stage.

Not every new tissue formation that is referred to with the term **tumor** is cancer. A distinction is made between the following tumor names:

- **Benign tumors** – non-cancerous tumors. They are characterized by slow growth, are usually localized and do not form metastases
- **Malignant tumors** – malignant tumors. They are characterized by invasive growth, are capable of metastasizing (can spread metastases) and are potentially life-threatening. A distinction is made here:
 - **solid tumors** (breast cancer, colon cancer, lung cancer,
 - **Leukemias** (AML – acute myeloid leukemia, ALL – acute lymphoblastic leukemia, CML – chronic myeloid leukemia, CLL – chronic lymphocytic leukemia)

Examples of solid malignant tumors:

- **Carcinomas** arise from degenerated cells in the epithelial tissue. This is skin or mucous membrane tissue or glandular tissue.
- **Sarcomas** arise from connective and supporting tissue (fat, cartilage, bone).
- **Teratomas** arise from embryonic tissue.
- **Lymphoma** is a malignant disease of the lymphatic system.

Examples of malignant hematological tumors:

Leukemias are malignant changes in **blood-forming cells** (AML, ALL, CML, CLL). The acute forms progress quickly, the chronic forms progress slowly.

Definition grading

Grading refers to the degree of **differentiation of the tumor cells**. There are different levels:

- **GX** – cannot be assessed
- **G1** – well differentiated
- **G2** – moderately differentiated, moderately different from normal tissue

- **G3** – poorly differentiated, strong deviation from normal tissue - aggressive
- **G4** – undifferentiated (very aggressive and very malignant), no similarity to normal tissue

Definition Staging (TNM System)

Staging shows the **spread of the tumor**.

T – size of the tumor (grade I – IV) T1 to T4

- Stage 0 = carcinoma in situ – early stage
- Stage I - III = localized to advanced tumor
- Stage IV - distant metastases

N – Lymph node involvement N0 – N3 (special abbreviations indicating which lymph nodes are affected)

- N0 – no regional lymph nodes affected
- NX – regional lymph nodes cannot be assessed
- N1 – Infection nearby (few lymph nodes)
- N2 – medium involvement = multiple lymph nodes
- N3 – distant and numerous lymph nodes affected

M – distant metastases – 0 = no and 1 = distant metastases present

Example: T2N2M1= this is a locally advanced tumor with involvement of multiple lymph nodes and distant metastases

Definition prevention of cancer

We differentiate between

- **primary prevention** (avoidance of risks)
- **secondary prevention** (early detection e.g. screening)
- **tertiary prevention** (regular checks after the illness in order to detect relapses at an early stage)

Measures for the primary prevention of cancer - here European Cancer Codex

1. Smoking

Don't smoke. Avoid using any tobacco products or e-cigarettes. If you smoke, you should stop.

2. Passive smoking

Avoid tobacco smoke in your living spaces and in your vehicle.

3. Overweight and obesity

Take steps to avoid or reduce overweight and obesity:

- Eat as few foods as possible that are high in calories, sugar, fat and salt.
- Consume as few drinks with a high sugar content as possible. Drink mostly water and unsweetened drinks.
- Eat as few highly processed foods as possible.

4. Movement

Exercise regularly in your everyday life. Spend as little time as possible sitting.

5. Nutrition

Include especially whole grain products, vegetables, legumes and fruit in your daily menu. Eat as little red meat as possible and avoid processed meat.

6. Alcohol

Avoid alcoholic drinks.

7. Breastfeeding

Breastfeed your baby for as long as possible.

8. Sunlight exposure

Avoid too much sun exposure, especially in children. Make sure you have adequate sun protection. Don't go to the solarium.

9. Risk factors for cancer in the workplace

Find out about cancer risk factors at work and ask your employer to protect you against them. Always follow health and safety instructions in your workplace.

10. Indoor radon gas

Find out about radon levels in your area using a local radon map. Have the values in your home measured by professionals and reduced if necessary.

11. Air pollution

Actively reduce exposure to air pollution

- Use public transport, walk or cycle instead of taking the car.
- Find low-traffic routes when walking, cycling or exercising outside.
- Keep your home smoke-free by not burning fuels such as coal or wood.
- Promote measures for better air quality.

12. Cancer-causing infections

- Have girls and boys vaccinated against hepatitis B virus and human papillomavirus (HPV), according to recommendations in your country.
- Obtain testing and treatment for hepatitis B and C viruses, human immunodeficiency virus (HIV), and *Helicobacter pylori*, according to recommendations in your country.

13. Hormone replacement therapy

If you decide to take hormone replacement therapy (for menopausal symptoms) after detailed advice from your doctor, you should limit its use to as short a period as possible.

14. Existing cancer prevention programs (examples Germany)

Participate in existing cancer screening programs recommended in your country for the following types of cancer:

- Colorectal cancer
- Breast cancer
- Cervical cancer
- Lung cancer
- Prostate cancer

- Skin cancer

Here the short version o the **European Cancer Codex**: Please decide, which version you would like to use

1. Smoking
2. Passive smoking
3. Overweight and obesity
4. Movement
5. Nutrition
6. Alcohol
7. Breastfeeding
8. Sunlight exposure
9. Risk factors for cancer in the workplace
10. Indoor radon gas
11. Air pollution
12. Cancer-causing infections
13. Hormone replacement therapy
14. Existing cancer prevention programs

