

CHAPTER 18: ONCOLOGY

***Building a Medical Terminology Foundation 2e* by Kimberlee Carter; Marie Rutherford; and Connie Stevens**

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18.1 - Introduction to Oncology

Learning Objectives

- Describe oncology and explore the physiology and activity of cancerous and non-cancerous growths
- Analyze, translate, and define medical terms and common abbreviations of oncology
- Practice the spelling and pronunciation of oncology terminology
- Identify the medical specialties associated with the oncology and explore common diseases, disorders, diagnostic tests, pharmacology, and procedures

Oncology Word Parts

Prefix

- **ana-** (up, apart)
- **apo-** (away from)
- **dys-** (abnormal; difficult)
- **ecto-** (outer)
- **endo-** (within)
- **hyper-** (excessive, increase)
- **meta-** (beyond, change)
- **mutat/o-** (to change)
- **neo-** (new)

Combining Form

- **Capsul/o-** (to box)
- **carcin/o-** (cancer)
- **miss/o-** (to send back)

- **mut/a-** (change)
- **path/o-** (disease)
- **nod/o-** (node)
- **onc/o-** (tumour)
- **sarc/o-** (flesh)

Suffix

- **-carcinom** (cancerous tumour of epithelial origin (internal or external lining of the body, i.e., skin, breast, colon))
- **-genesis** (condition of production, origin)
- **-oma** (tumour)
- **-plasia** (condition of formation)
- **-plasm** (formation)
- **-sarcoma** (connective tissue cancer, such as bones, tendons, cartilage, muscle, and fat)
- **-stasis** (standing still)

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Introduction to Oncology

Oncology is the study of tumours; oncologists are the people who study tumours. Carcin/o is a medical term that means cancer. All cancers are considered **neoplasms** which means new growth. Cancerous tumours are called **malignant**. A non-cancerous tumour is called **benign** (good); this is determined through a **biopsy** (Bx). A benign tumour often has the suffix -oma at the end of the word. However, a malignant tumour indicates that there is a cancerous growth. Malignant cells usually multiply rapidly, forming a mass of abnormal cells that enlarges, ulcerates and sheds malignant cells that invade surrounding tissues. These terms will usually have the word carcinoma at the end of the word. The medical specialty of oncology primarily treats patients who have cancer.

The suffix -oma means **tumour**, an abnormal tissue mass that forms through uncontrolled cell growth and divides more than it should. The cells also do not die when they should.

Watch What is Cancer? What Causes Cancer & How is it Treated? (5 min) on YouTube (https://youtu.be/SGaQ0WwZ_0I?si=N6S0QpG6D9nKqHfl)

What is producing cancer? What are some carcinogens? A **carcinogen** is a cancer-generating/producing substance. Carcin/o means cancer, and the suffix -gen means producing. There are various causes of cancer, yet many are unknown at this time. Bacteria and viruses, diet, hormones, smoking, radiation, alcohol, environment, chemical, and genetics are all potential risk factors and causes of cancers.

Watch How do cancer cells behave differently from healthy ones? (4 mins) on YouTube
(<https://youtu.be/BmFEoCFDi-w?si=IgQlylP0FosDmqwr>)

Oncology Abbreviations

Oncology Abbreviations

- **BCC-** (basal cell carcinoma)
- **BMT-** (bone marrow transplant)
- **BSE-** (breast self-examination)
- **Bx-** (biopsy)
- **CA-** (cancer)
- **CIS-** (carcinoma in situ)
- **FOBT-** (fecal occult blood test)
- **G -** (grade)
- **Mets-** (metastases)
- **SCC-** (squamous cell carcinoma)
- **TNM-** (tumour-nodes-metastases)
- **TSE-** (testicular self-examination)

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18.2 - Oncology Diagnostic Tools

A biopsy examines the lesion, growth or tumour under a microscope to determine the disease. Once the pathologist determines the issue is malignancy, then grading, staging and metastasis are evaluated.

Grading, Staging and Metastasis

Tumours are also graded as per growth and staged as per the cancer cell spreading.

Grading: Pathologists need to know how different a cancer cell is from a normal one: this is called grading. It is a measure of the severity of cancer. Grading ranges from I to IV, or low grade and high grade. Generally, a lower grade represents a more favourable prognosis.

- **Staging:** Includes the size and spread of cancer from its original site. If it is determined from a pathology report, it is called **pathologic staging**. If diagnostic techniques determine it, it is called **clinical staging**.
- **TNM staging:** Stands for tumour, node, metastasis.
- **T-** indicates the size of the primary tumour and the degree of spread into nearby tissues (local invasion)
- **N-** indicates whether or not cancer has spread to nearby lymph nodes, the size of the nodes that contain cancer, and how many lymph nodes are affected.
- **M-** The cancer cells have spread to other organs, called metastasis or Mets.

Once the TNM is determined for particular cancer, an overall stage is determined. The stage ranges from 0 to IV (0-4). These numbers help identify whether the cancer is early or advanced. The higher the number, the more advanced cancer:

- **stage 0** -carcinoma in situ (cancer appears only at the site and has not spread).
- **stages I and II** -the cancer is limited to the organ or location where it began, or it may have spread to a nearby structure (localized spread).
- **stage III** -cancer has spread further into a surrounding structure or to the regional lymph nodes (regional spread).
- **stage IV** -cancer has spread to a distant site in the body (metastatic spread).

Watch How is Cancer Staged? (4 min) on YouTube (<https://youtu.be/-pHilR4dtoA>)

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18.3 - Oncology Diseases, Disorders, Treatment

Cancers within Body Systems

Carcinomas make up most of all cancers and are malignant tumours of epithelial tissues. Epithelial tissue line the body surfaces, including those of glands and organs, therefore, carcinomas make up most glandular cancers and are often found in the breast, stomach, uterus, tongue, and skin. The tumours are labelled according to where the malignancy or the primary tumour is housed.

Sarcomas originate in the connective or supportive tissue of the body, such as the muscles, tendons, fat, joints, and bones. They are named by adding the suffix -oma, meaning tumour, to the end of the combining word.

Leukemias are cancer of blood-forming tissues. **Lymphomas** are cancerous tumours of the lymph nodes. In comparison, **myeloma** is a cancerous tumour arising from the hematopoietic portion of the bone marrow.

Endocrine system

Cancers commonly occur in the endocrine system. Many such as thyroid cancer, can be treated by surgically removing the gland. The client must take a synthetic version of the necessary hormones.

Pancreatic cancer is almost always fatal because no effective treatments are currently available (McDonnell et al., 2019).

Female Reproductive system

When looking at the female reproductive system, many organs can be susceptible to cancer: breast, uterine, ovarian, and cervical cancer.

Fibroids tend to be benign (non-cancerous) but should be monitored to ensure their growth does not change. A hormonal disturbance usually causes these growths.

Breast Cancer

Breast cancer is common in females; however, males can get breast cancer, and make up less than 1% of all breast cancers. Breast cancer may be detected through breast self-examination. Breast self-examination (BSE) is crucial in determining if a person's breast lumps or bumps are growing or have changed (Sessa et al., 2023).

There are different types of breast cancers, including:

- Cancer which begins in the milk ducts (**ductal carcinoma**). Most male breast cancer is ductal carcinoma.
- Cancer which begins in the milk-producing glands (**lobular carcinoma**). This type is rare in men because they have few lobules in their breast tissue.
- Other rarer types of breast cancer include Paget's disease of the nipple and inflammatory breast cancer.

Gastrointestinal

The gastrointestinal system has many different types of cancer. They include the esophagus, the stomach, the pancreas, the rectum, or the liver (Faigel & Rodriguez, 2022). A typical test conducted is the **fecal occult blood test (FOBT)**. It is a test done on the stool. It is looking for hidden or occult blood within the fecal matter.

Integumentary System

Skin cancer is quite common due to exposure to the sun and other radiation. When looking at the ABCDE of cancer:

- A is the lesion is asymmetrical
- B is the rough-edged borders, which determines if the lesion has spread
- C is the colour. What colour is the tumour?
- D is the diameter. Is the lesion growing in width?
- E is the lesion elevated or evolving

Basal cell carcinoma (BCC) is the most common type of skin cancer.

Squamous cell carcinoma affects the squamous epithelium layer of the skin.

Melanoma, often called malignant melanoma is a deadly cancer. The colour black means melan/o, -oma means tumour.

People who are at the highest risk tend to be those who are fair-skinned. Light skin contains less melanin, which allows the absorption of radiation. The elderly, who have endured a lifetime of sunlight exposure, are also at higher risk. The use of sunscreen and avoidance of prolonged exposure to the sun not only reduces the damage to the skin but prevents the development of skin cancer (Thanh et al., 2020).

Dermatofibroma is a fibrous tumour of the skin.

Lymphatic System

Lymphoma is any tumour or a mass within the lymph node. Hodgkin's lymphoma is a malignant disease of the lymph nodes.

Male Reproductive System

When looking at the male reproductive system, a male may have cancer of the testicles, penis, or prostate gland.

Testicular self-examinations (TSE) are essential to determine a tumour and its growth.

As men age, their prostate will overgrow, and it is important to have a biopsy done to determine if the prostate is benign or cancerous. Prostate cancer is typically slow-growing, and most men will die with the cancer, not from cancer.

As men age as early as 40 years of age, they may experience the symptoms of benign prostatic hyperplasia (BPH), which is extremely common. It is a benign, non-cancerous growth which may have the same symptoms as prostate cancer, therefore, a biopsy should be conducted to determine if the enlargement is malignant or benign.

The treatment for testicular cancer is to perform an orchidectomy. It is an aggressive and primary surgical approach to treating testicular cancer. If the patient wants to father children, several semen samples can be stored for possible future use before the orchidectomy (Kaufman et al., 2019)

Musculoskeletal

Sarc/o is connective tissue

Oste/o is bone.

Leimy/o is smooth muscle, such as areas within the abdomen, uterus and blood vessels.

The musculoskeletal carcinomas treatment varies and can include a bone marrow transplant, radiation, and chemotherapy.

Urinary System

Within the urinary system, a person may have kidney or bladder cancer.

A congenital kidney cancer called a Wilms tumour is not detected until a child grows. The child is born with a tumour, and as the toddler grows and starts to walk, it is noted that the child's abdomen is protruding significantly. That is because the kidneys, which are at the back of the body, have enlarged due to the tumour. The enlarged kidneys push the abdomen forward. The child may have a low-grade fever without a known cause. This cancer can be deadly if not caught early, and often children will die from this disease (Aldrink et al., 2019)

Pharmacology

There are many different types of cancer medications. These include **alkylating agents, antimetabolites, and plant alkaloids**.

Physicians use cancer medications alone or in combination with other treatments, such as radiation therapy. The best type and combination will depend on several factors, including the disease progression and the patient's overall health.

Treatment for cancer

The most commonly used methods for cancer treatment include surgery, radiation therapy, and chemotherapy (treatment with chemicals). Newer methods of immunotherapy use substances that stimulate the immune system. Hormone therapy may be effective against certain types of tumours. When there are no active signs of the disease, the cancer is said to be in remission.

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Vocabulary & Check Your Knowledge

Oncology Vocabulary

Basal Cell carcinoma (BCC)

The most common type of skin cancer.

Benign

A non-cancerous tumour.

Benign prostatic hyperplasia (BPH)

A common, benign, non-cancerous growth which may have the same symptoms as prostate cancer.

Biopsy (Bx)

A diagnostic procedure that examines the lesion, growth or tumour under a microscope to determine the disease.

Carcinogen

A cancer-generating/producing substance.

Carcinomas

Malignant tumours of epithelial tissues that make up most of all cancers.

Dermatofibroma

A fibrous tumour of the skin.

Ductal carcinoma

A form of breast cancer which begins in the milk ducts. Most male breast cancer is ductal carcinoma.

Fecal occult blood test (FOBT)

A test done on the stool, looking for hidden or occult blood within the fecal matter.

Fibroids

Benign (non-cancerous) growths in the female reproductive system usually caused by a hormonal disturbance.

Hodgkin's lymphoma

A malignant disease of the lymph nodes.

Lobular carcinoma

A breast cancer which begins in the milk-producing glands.

Leukemias

Cancer of blood-forming tissues.

Lymphoma

Any tumour or a mass within the lymph node.

Malignant

A cancerous tumour.

Melanoma

Often called malignant melanoma; a deadly skin cancer.

Myeloma

A cancerous tumour arising from the hematopoietic portion of the bone marrow.

Orchidectomy

An aggressive and primary surgical approach to treating testicular cancer.

Paget's disease

A rare type of breast cancer affecting the nipple.

Pancreatic cancer

A cancer of the endocrine system that is almost always fatal because no effective treatments are currently available.

Sarcomas

Cancers that originate in the connective or supportive tissue of the body, such as the muscles, tendons, fat, joints, and bones.

Squamous cell carcinoma

A cancer that affects the squamous epithelium layer of the skin.

Tumour

An abnormal tissue mass that forms through uncontrolled cell growth and divides more than it should. The cells also do not die when they should.

Wilms tumour

A congenital kidney cancer often not detected until a child grows.

Oncology Reinforcement Activity

Oncology Reinforcement Activity (Text version)

1. A tumour _____[Blank 1].
 - a. is an injury of the nervous system.
 - b. is a function of the endocrine system.
 - c. is a medical specialty that primarily treats infections.
 - d. is an abnormal tissue mass that forms through uncontrolled cell growth and divides more than it should.
2. Some potential risk factors and causes of cancers include _____[Blank 2].
 - a. a healthy lifestyle.
 - b. bacteria and viruses, diet, hormones, smoking, radiation, alcohol, environment, chemicals, and genetics.
 - c. a healthy and balanced diet.
 - d. regular exercise.
3. Cancerous growths or tumours can be diagnosed by _____[Blank 3].
 - a. aggressive chemical treatments.
 - b. a biopsy to examine the lesion, growth or tumour under a microscope to determine the disease.
 - c. performing a series of radiation treatments.
 - d. administering oral antibiotics to the patient.
4. Lymphoma is _____[Blank 4].
 - a. any tumour or a mass within the lymph node.
 - b. a type of cancer occurring in the endocrine system.
 - c. a type of cancer that primarily affects the blood.
 - d. a cancer that affects the bone marrow.

Check your answers:¹

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Notes

1. d) is an abnormal tissue mass that forms through uncontrolled cell growth and divides more than it should, 2. b) bacteria and viruses, diet, hormones, smoking, radiation, alcohol, environment, chemicals, and genetics, 3. b) a biopsy to examine the lesion, growth or tumour under a microscope to determine the disease., 4. a) any tumour or a mass within the lymph node

References

Aldrink, J. H., Heaton, T. E., Dasgupta, R., Lautz, T. B., Malek, M. M., Abdessalam, S. F., Weil, B. R., Rhee, D. S., Baertschiger, R., Ehrlich, P. F., & American Pediatric Surgical Association Cancer Committee (2019). Update on Wilms tumor. *Journal of pediatric surgery*, 54(3), 390–397. <https://doi.org/10.1016/j.jpedsurg.2018.09.005>

Canadian Cancer Society. (2024). *Stage and grade*. <https://cancer.ca/en/cancer-information/what-is-cancer/stage-and-grade>

Cancer Centre (2013, Oct 31). *What is cancer? What causes cancer & How is it treated?* [Video]. YouTube. https://youtu.be/SGaQ0WwZ_0I?si=N6S0QpG6D9nKqHfl

Cancer Center. (2018, Aug 8). *How is cancer spread?* [Video] YouTube. <https://youtu.be/-pHilR4dtoA?si=uA3ptNfMwJAYB2RY>

Faigel, D. O., & Rodriguez, S. A. (2021). Gastric cancer. In *Atlas of Endoscopic Ultrasonography, second edition* (pp. 53–57). Wiley. <https://doi.org/10.1002/9781119522997.ch13>

Kaufman, J. M., Lapauw, B., Mahmoud, A., T'Sjoen, G., & Huhtaniemi, I. T. (2019). Aging and the male reproductive system. *Endocrine reviews*, 40(4), 906–972. <https://doi.org/10.1210/er.2018-00178>

McDonnell, J. E., Gild, M. L., Clifton-Bligh, R. J., & Robinson, B. G. (2019). Multiple endocrine neoplasia: an update. *Internal medicine journal*, 49(8), 954–961. <https://doi.org/10.1111/imj.14394>

Sessa, C., Balmaña, J., Bober, S. L., Cardoso, M. J., Colombo, N., Curigliano, G., Domchek, S. M., Evans, D. G., Fischerova, D., Harbeck, N., Kuhl, C., Lemley, B., Levy-Lahad, E., Lambertini, M., Ledermann, J. A., Loibl, S., Phillips, K. A., Paluch-Shimon, S. (2023). Risk reduction and screening of cancer in hereditary breast-ovarian cancer syndromes: ESMO Clinical Practice Guideline. *Annals of oncology : official journal of the European Society for Medical Oncology*, 34(1), 33–47. <https://doi.org/10.1016/j.annonc.2022.10.004>

TED-Ed. (2012, December 12). *How do cancer cells behave differently from healthy ones?* [Video]. YouTube. <https://youtu.be/BmFEoCFDi-w?si=roGFWXrI6nZN1hv4>

Thanh, D. N. H., Prasath, V. B. S., Hieu, L. M., & Hien, N. N. (2020). Melanoma skin cancer detection method based on adaptive principal curvature, colour normalisation and feature extraction with the ABCD Rule. *Journal of Digital Imaging*, 33(3), 574–585. <https://doi.org/10.1007/s10278-019-00316-x>