

RU RMT 2
Anatomy and Physiology
Lecture 7
Cell Bio Cancer

Principles of Cancer

- * Cancer or malignancy is a group of diseases characterized by **uncontrolled or abnormal cell proliferation**
- * When cells in a part of the body divide without control, the excess tissue that develops is called a **malignant tumor or neoplasm**



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Principles of Cancer

- * One property of most malignant tumors is their ability to undergo **metastasis**, which is defined as the spread of cancerous cells from the primary site, to other parts of the body



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Metastasis

Some kinds of cancer are more likely to spread to the bones than others. The most common types of cancer that spread to the bones are:

- * breast
- * prostate
- * lung
- * kidney
- * Thyroid



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Cancer

❓ The different types of cancer are based on the type of tissue from which it develops, and include:

1. **Carcinomas:** arise from epithelial cells (tissue lining skin and organs)
2. **Melanomas:** arise from melanocytes (skin epithelial cells that produce melanin)
3. **Sarcoma:** arise from connective tissues such as bones
4. **Leukemia:** arise due to the rapid growth of abnormal leukocytes (white blood cells)
5. **Lymphoma:** arise from lymphatic tissue (for example lymph nodes)



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Growth & Spread of Cancer

1. As malignant cells invade surrounding tissues they trigger the growth of new blood vessels and this process is referred to as **angiogenesis**
1. As the cancer grows, it begins to compete with normal tissues for space and nutrients, and eventually the normal tissue decreases in size and dies



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Growth & Spread of Cancer

- 3. Some malignant cells may detach from the initial (primary) tumor and invade a body cavity or enter the blood or lymph, then circulate and invade other body tissues eventually establishing secondary tumors
- 3. The pain associated with cancer develops when the tumor presses on nerves or blocks a passageway in an organ so that secretions build up pressure or as a result of dead tissue or organs



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Growth & Spread of Cancer

Several factors may trigger a normal cell to lose control and become cancerous, and include:

- * **Environmental factors:**

1. These are substances present in the environment, and an agent that can produce cancer is known as a carcinogen
2. Carcinogens cause cancer by inducing mutations in the DNA

- * **Viral origin:**

1. Viruses, such as Epstein--Barr virus, that can cause cancer are known as oncogenic viruses

- * **Chromosomal abnormalities:**

1. Occur due to changes in genes that induce increased cell division



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Red Flags: History Taking

- * Past history of cancer
- * Unexplained weight loss
- * Failure to improve with therapy
- * Night pain
- * Night sweats
- * Pain at rest
- * Age >50 or < 18



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