Cancer can be benign or malignant. Benign tumors aren't harmful, localized, and slow growing; while, malignant tumors are fast growing and harmful as they can invade and destroy surrounding tissues.

Malignant cancer is divided into solid tumors and hematological malignancies:
1. Solid tumor: there are two types of solid tumor, a) Carcinoma is the tumor of epithelial cells, such as lung and breast cancer, b) Sarcoma is the tumor of connective tissue such as bone (osteosarcoma) and muscle (leiomyosarcoma).
2. Hematological malignancies: is divided into, a) Lymphomas are tumors of the lymphatic system, such as Hodgkin and non-Hodgkin lymphomas, b) Leukemias are tumors of blood-forming elements. Leukemias are classified as acute or chronic and myeloid or lymphoid.

Incidence
Cancer is the second leading cause of death in the United States. Most common cancers are breast, prostate, and colorectal. The leading cause of cancer death is lung cancer.

Cause
1. Viruses, such as human papillomavirus (HPV) causes cervical cancer.
2. Environmental and occupational exposures, such as ionizing and ultraviolet radiation.
3. Lifestyle factors, such as high-fat, low-fiber diets.
4. Medications, including alkylating agents and immunosuppressants.
5. Genetic factors, including inherited mutations and cancer-causing genes (oncogenes).

Cell Growth Kinetics
- Cell growth fraction is the proportion of the dividing cells in the tumor. A large tumor has low cell growth fraction because there is no enough space, nutrients, and blood for tumor cells to divide.
- Cell cycle time is the average time for a tumor cell to complete mitosis and divide and daughter cells go through mitosis and divide to more cells. Each tumor has specific cell cycle time.
- Tumor doubling time is the time for the tumor to double in size. A large tumor has longer doubling time because it has low proportion of actively dividing cells.

Tumor cell burden
- It is the number of tumor cells in the body. A large number of tumor cells (approximately 10^9 cells) is required to be clinically detectable.
- There is a hypothesis called (cell kill hypothesis), it states that each cycle of chemotherapy kills certain percentage of tumor cells, but the tumor burden would never reach absolute zero, because only a percentage of cells are killed with each chemotherapy cycle (Less than 10^4 cells may depend on elimination by the host’s immune system). Moreover, cells in G0 may be