

## Principles of cancer treatment

**Cancer:** is a group of more than 100 different diseases that are characterized by uncontrolled cellular growth, local tissue invasion, and distant metastases.

**There are two types of tumors:** benign and malignant.

**A benign tumor** is of a uniform size and shape and displays no invasiveness (in terms of infiltrating other tissues) or metastatic properties. The terms nonmalignant and benign suggest that tumors may be harmless, which is true in most cases. However, a benign tumor can be lethal if it grows large enough to mechanically interrupt the normal function of a critical tissue or organ.

**Malignant neoplasms** consist of cancer cells that invade (infiltrate) surrounding tissues and metastasize to other tissues and organs.

### **Pathology of cancer: tumor origin**

Tumors may arise from any of the four basic tissue types

- 1.Epithelial tissue,
- 2.Connective tissue (i.e., muscle, bone, and cartilage)
- 3.Lymphoid tissue
- 4.Nerve tissue

### **Clinically detectable cancer**

A tumor mass cannot be detected by physical examination or radiological studies until it is at least 1 cm in diameter.

Tumors of deep internal organs e.g. colon, escape detection until they are much larger

A 1 cm mass weighs about 1 gram and contains about 1 billion ( $1 \times 10^9$ ) cells, this process takes 5-7 years at the average rate of growth of solid tumors.

Some tumor cells die because of these restrictions, other are destroyed by the host immune system.

Chemotherapy is most successful in killing tumor cells when the total number is low, and the growth fraction is high.

## **Goals of cancer treatment**

### **1- Primary goal**

1-Cure the patient

2-Render him clinically and pathologically free of disease and return their life expectancy to that of healthy individuals of the same age and sex.

3-Current therapies do not offer cures for all patients

### **2-The best alternative goal**

To prolong survival while maintaining the patient's functional status and quality of life.

### **3- The 3rd goal**

Reliving symptoms such as pain for patients in whom the likelihood of cure or prolonged survival is very low.

## **Modalities of cancer treatment**

### **The Major Modalities**

- Surgery
- Radiation
- Chemotherapy
- Biological therapy

### **I-Surgery**

1- The oldest cancer treatment

2- Treat the primary cancer

3- To remove isolated metastatic masses

4- Diagnosis and Staging

#### **Treat complication**

a. Hemorrhage

b. Perforation

c. Bowel obstruction

d. Spinal cord compression

## **II- Radiation**

- 1-It is the destruction of cancer cells by ionizing radiation
- 2-Usually administered in small doses over several weeks (fractionating)

### **Side Effects**

Radiation can never be directed only at tumor and normal cells and tissue are also damaged

The most sensitive tissues are those that undergo continuous cell renewal such as the skin, hair, GI mucosa, bone marrow, reproductive tissue, and sweat glands GI.

In slowly growing tissue such as lungs, effects of radiation is seen much later

N.B:

- 1-The nurse monitors a patient who is experiencing thrombocytopenia from severe bone marrow suppression by looking for, excessive bleeding and bruising.

## **III-Chemotherapy**

refers to the use of conventional cytotoxic drugs in addition to hormonal and endocrine therapy.

Chemotherapy is used as 1ry treatment and is given with the intent to cure or prolong life.

N.B:

- 1- A patient is experiencing stomatitis after a round of chemotherapy; we Clean the mouth with a soft-bristle toothbrush and warm saline solution.
- 2- The nurse is caring for a patient who becomes severely Nauseated during chemotherapy, provide antiemetic medications 30 to 60 minutes before chemotherapy begins.
- 3- A patient receiving chemotherapy is experiencing severe bone marrow suppression. Risk for infection
- 4-If extravasation of an antineoplastic medication occurs, we must Stop the infusion immediately while leaving the catheter.

5-. The nurse is assessing a patient who has experienced severe neutropenia after chemotherapy and will monitor for which possible signs of infection Fever, Sore throat, Chills.  
in place

### **Uses**

A-Limited in case of primary localized cancer, since only a few solid tumors are sensitive enough to be treated with drugs alone.

B-chemotherapy is the main treatment in disseminated cancer, because drugs go almost everywhere in the body

N.B: Chemotherapy cannot reach two areas

1-central nervous system

2-Testes

## **IV Biological therapy**

The immune system is an effective antitumor defense, Malignant cells occasionally arise in healthy bodies because of mutations but not all these cells give rise to clinically evident cancer, the use of immune system therapies such as interferons, interleukins, tumor vaccines, and antibody and gene therapy to treat cancer

**Biological therapies boost the immune system, either directly or indirectly by:**

1-making cancer cells more recognizable by the immune system, and more susceptible to destruction

2-boosting the killing power of immune system cells

3-changing the way cancer cells grow, so that they act more like healthy cells

4-stopping the process that changes a normal cell into a cancerous cell

5-enhancing the body's ability to repair or replace normal cells damaged or destroyed by other forms of cancer treatment, such as chemotherapy or radiation

6-preventing cancer cells from spreading to other parts of the body

## **NURSING PROCESS ASSESSMENT**

- 1- past and present medical history; family history; medication profile with a notation of allergies as well as a listing of all prescription drugs, over the counter (OTC) drugs, and herbals.
- 2- height, weight, and vital signs.
- 3- baseline hearing and vision testing (as ordered).
- 4- Also assess bowel and bladder patterns.
- 5- neuro-logic status, heart sounds, heart rhythm, breath sounds, and lung function.
- 6- Examine the skin and mucosa, giving attention to turgor, hydration, color, and temperature.
- 7- Note any signs and symptoms of fear and anxiety with attention to complaints of insomnia, irritability, shakiness, restlessness, and/or palpitations.
- 8- Also complete an assessment of culture.
- 9- Perform a pain assessment using objective methods such as an intensity rating scale (e.g., 0 to 10, where 0 = no pain and 10 = worst pain ever).
- 10- Note the pattern of pain, focusing on the location, quality, onset, duration, and precipitating or alleviating factors. Document any oral, pharyngeal, esophageal, and/or abdominal pain; painful swallowing; epigastric or gastric pain, especially after eating spicy or acidic foods; achiness in joints or lower extremities; or numbness, tingling, and any burning or sharp pain.
- 11- For bone marrow suppression: Assess for signs and symptoms of anemia or the decrease in RBCs, hemoglobin level, and hematocrit.