



“बेटी बचाओ, बेटी पढ़ाओ”

JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

(Format for Preparing E Notes)

Faculty of physiotherapy & diagnostics

Faculty Name- JV'n Ankita
Program- M.Sc. Zoology 3rd Semester
Course Name - Cancer & Radiation biology
Session No. & Name – Basics & Symptoms of Cancer

Program Outcome-It plays an important role in health sector, provides knowledge about the treatment of patient by the help of physiotherapy.

Course Outcome- Understand the fundamentals and basic physics which is used or responsible for the imaging process in medical sector and how to do the image interpretation.

Academic Day starts with –

Greeting with saying ‘**Namaste**’ by joining Hands together following by 2-3 Minutes Happy session, Celebrating birthday of any student of respective class and **National Anthem**.

Review of previous Session- **mitosis**

Today We will discuss about- **Basics & Symptoms of Cancer**

Lesson deliverance (ICT, Diagrams & Live Example)- ICT, Diagrams

➤ Diagrams

Introduction & Brief Discussion

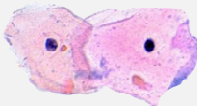
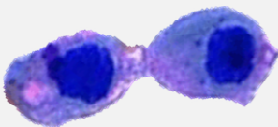
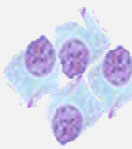
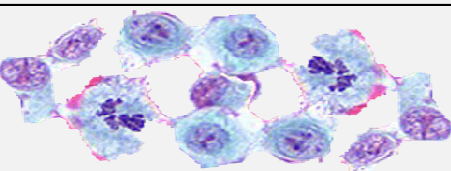

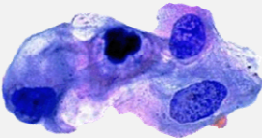
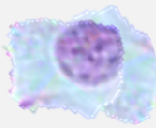
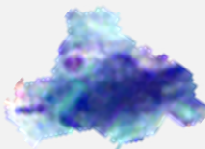
Cancer :-

Cancer cells grow and divide at an abnormally rapid rate, are poorly differentiated, and have abnormal membranes, cytoskeletal proteins, and morphology. The abnormality in cells can be progressive with a slow transition from normal cells to benign tumors to malignant tumors.

How do you know if a tumor is cancerous?

A doctor may perform a physical exam and order blood tests if they suspect cancer, but the only way to confirm the presence of disease is with a biopsy.

During a biopsy, the doctor will take a small tissue sample from the tumor, then send the sample to a laboratory so it can be tested for cancer or other signs of disease. A pathologist will analyze the sample under a microscope and determine whether cancer has been detected and whether it's spread in the body. The pathologist may also help identify features of the tumor that help guide treatment decisions.

Normal	Cancer	
		Large, variably shaped nuclei
		Many dividing cells; Disorganized arrangement
		Variation in size and shape
		Loss of normal features

Symptoms:-

- Fatigue
 - Lump or area of thickening that can be felt under the skin
 - Weight changes, including unintended loss or gain
 - Skin changes, such as yellowing, darkening or redness of the skin, sores that won't heal, or changes to existing moles
 - Changes in bowel or bladder habits
 - Persistent cough or trouble breathing
 - Difficulty swallowing
 - Hoarseness
 - Persistent indigestion or discomfort after eating
 - Persistent, unexplained muscle or joint pain
 - Persistent, unexplained fevers or night sweats
 - Unexplained bleeding or bruising
-

Causes:-

Cancer is caused by changes (mutations) to the DNA within cells. The DNA inside a cell is packaged into a large number of individual genes, each of which contains a set of instructions telling the cell what functions to perform, as well as how to grow and divide. Errors in the instructions can cause the cell to stop its normal function and may allow a cell to become cancerous.

What do gene mutations do?

A gene mutation can instruct a healthy cell to:-

Allow rapid growth. A gene mutation can tell a cell to grow and divide more rapidly. This creates many new cells that all have that same mutation.

Fail to stop uncontrolled cell growth. Normal cells know when to stop growing so that you have just the right number of each type of cell. Cancer cells lose the controls (tumor suppressor genes) that tell them when to stop growing. A mutation in a tumor suppressor gene allows cancer cells to continue growing and accumulating.

Make mistakes when repairing DNA errors. DNA repair genes look for errors in a cell's DNA and make corrections. A mutation in a DNA repair gene may mean that other errors aren't corrected, leading cells to become cancerous.

These mutations are the most common ones found in cancer. But many other gene mutations can contribute to causing cancer.

What causes gene mutations?

Gene mutations can occur for several reasons, for instance:

- **Gene mutations you're born with.** You may be born with a genetic mutation that you inherited from your parents. This type of mutation accounts for a small percentage of cancers.
- **Gene mutations that occur after birth.** Most gene mutations occur after you're born and aren't inherited. A number of forces can cause gene mutations, such as smoking, radiation, viruses, cancer-causing chemicals (carcinogens), obesity, hormones, chronic inflammation and a lack of exercise.

Gene mutations occur frequently during normal cell growth. However, cells contain a mechanism that recognizes when a mistake occurs and repairs the mistake. Occasionally, a mistake is missed. This could cause a cell to become cancerous.

How do gene mutations interact with each other?

The gene mutations you're born with and those that you acquire throughout your life work together to cause cancer.

For instance, if you've inherited a genetic mutation that predisposes you to cancer, that doesn't mean you're certain to get cancer. Instead, you may need one or more other gene mutations to cause cancer. Your inherited gene mutation could make you more likely than other people to develop cancer when exposed to a certain cancer-causing substance.

University Library Reference-

- The Physics Of Radiology and Imaging by K. THAYALAN
- Textbook of Radiology for Residents and Technicians by S. K. BHARGAVA
- Suggestions to secure good marks to answer in exam-
 - Explain answer with key point of the answers

Questions to check understanding level of students-

- HOW MUTATION OCCURS IN A NORMAL CELL SO THAT IT BECOMES CANCEROUS ?
- WHAT ARE THE SYMPTOMS OF CANCER ?
- Next Topic- **TYPE OF CANCER.**
- National song' **Vande Mataram**'.