

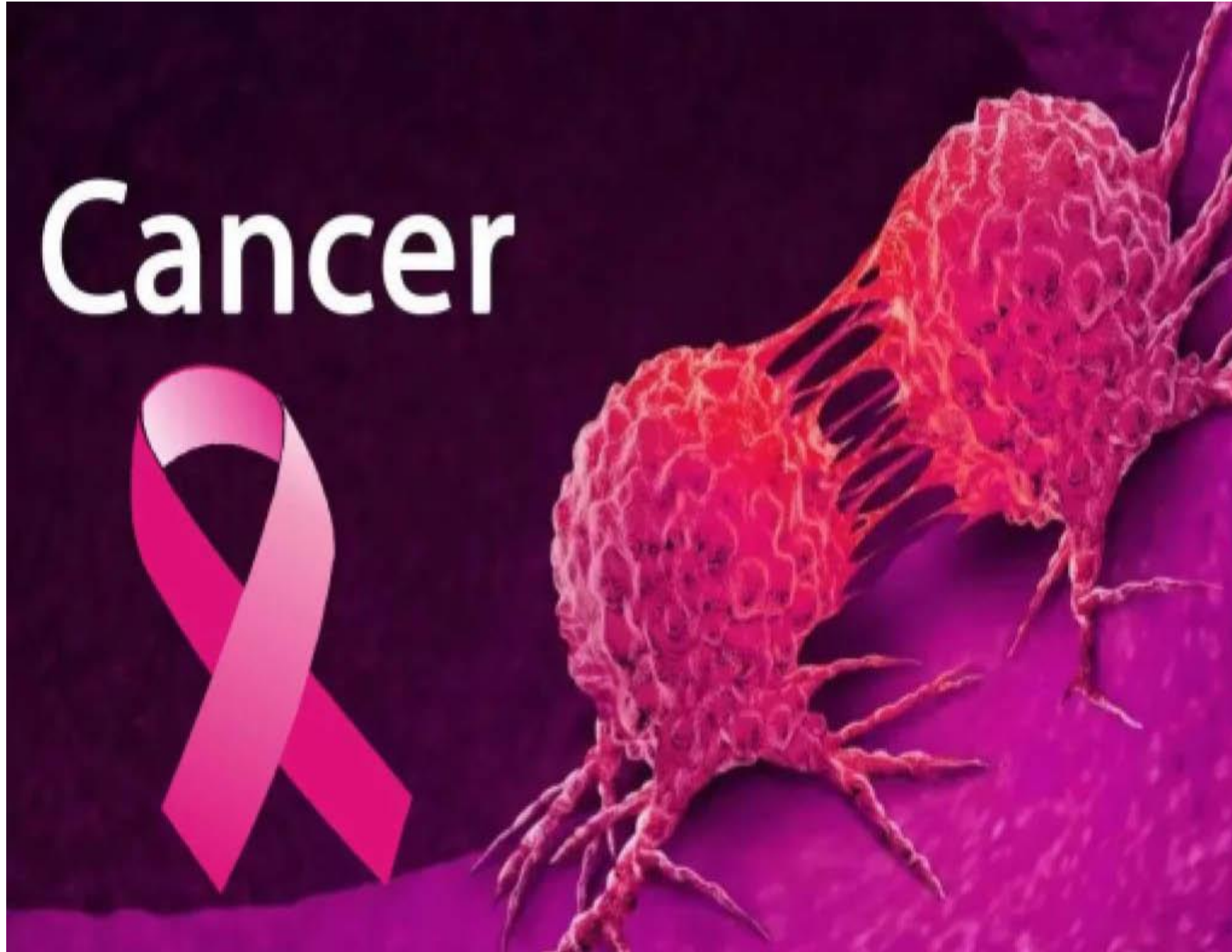
DEPARTMENT : Department of Nursing

COURSE NAME : B. Sc. (Nursing) II Year IV Semester

SUBJECT : Genetics

UNIT III : Genetic conditions of adolescents and adults

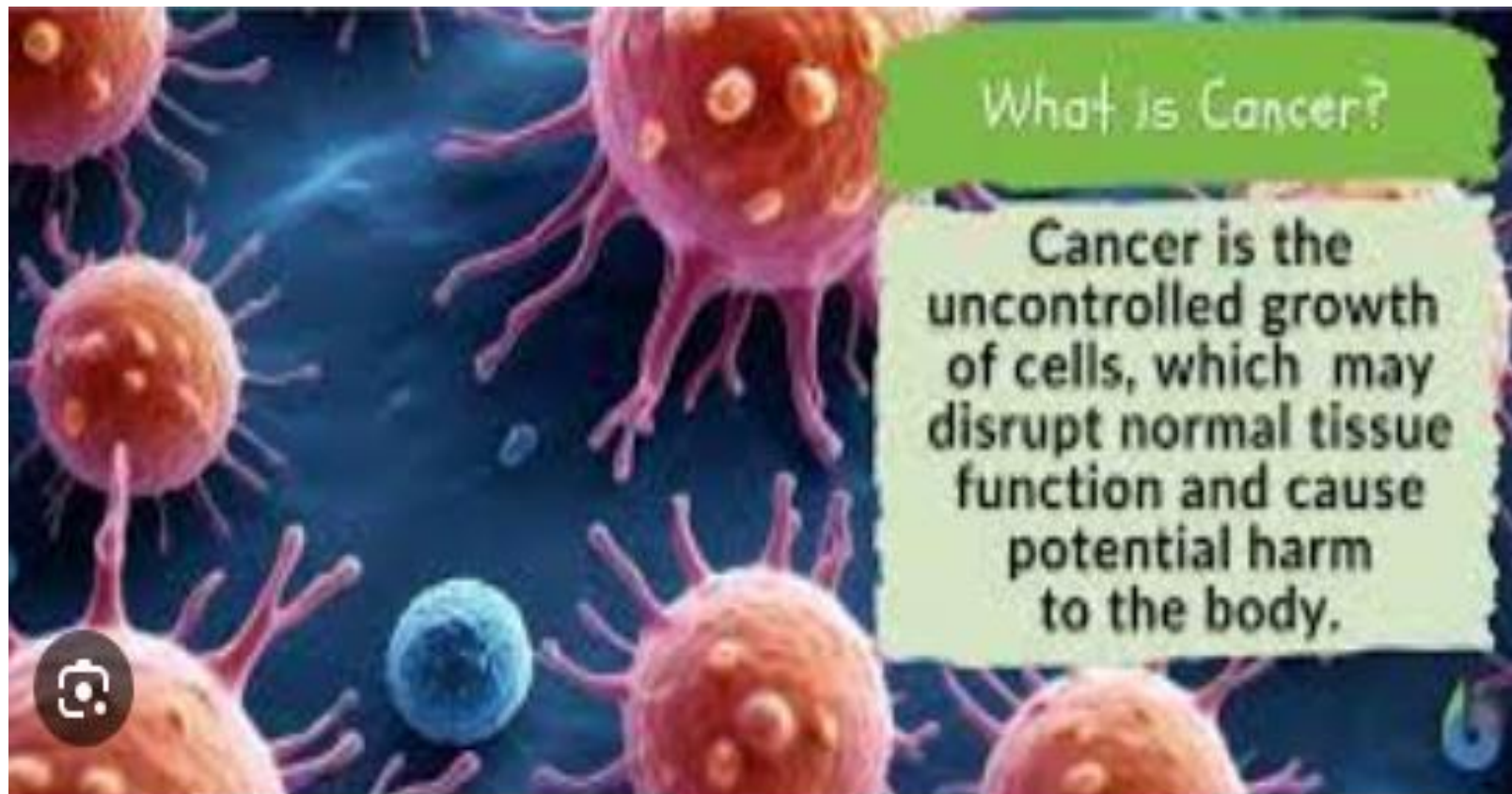
TOPIC :Cancer genetics: Familial cancer



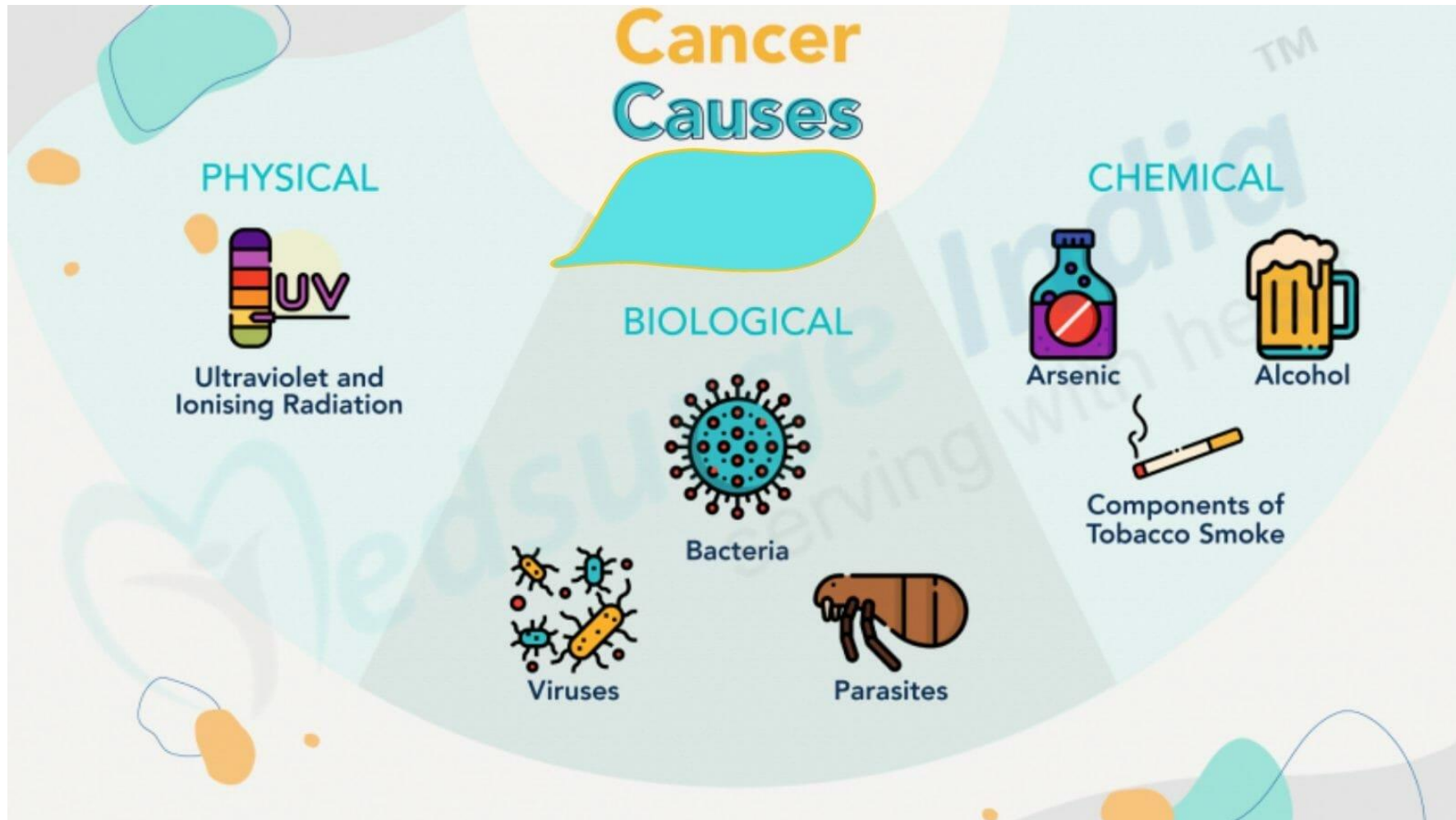
Cancer genetics Introduction

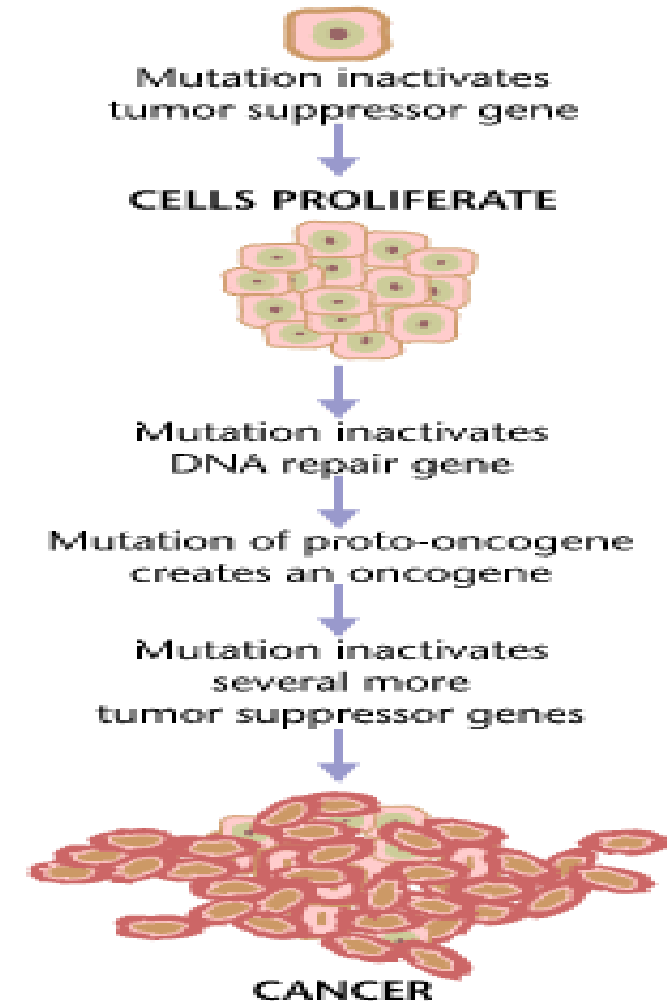
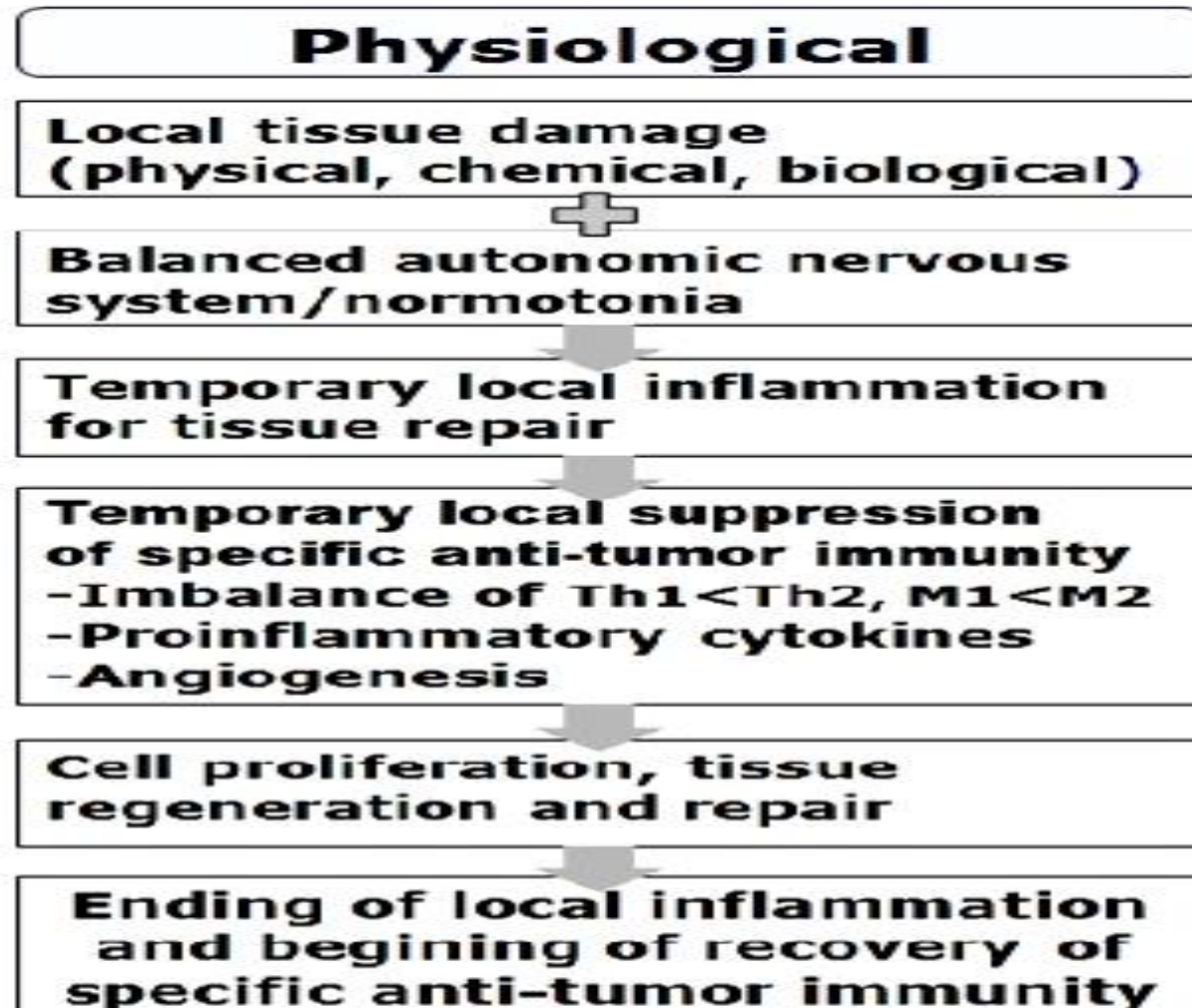
- ❖ Cancer has afflicted human throughout recorded history.
- ❖ Some of the earliest evidence is found among fossil bone tumors, human mummies in Egypt and ancient manuscripts.
- ❖ The term cancer was coined by the Greek physician Hippocrates (460-370 BC) – Father of Medicine;
- ❖ He used the term carcinos and carcinoma to describe non- ulcer forming and ulcer forming tumors.
- ❖ These words were referred to a crab because of finger like projections from a cancer called to mind the shape of a crab.
- ❖ The recent advancement in genetics has opted for the treatment and prevention aspects as well.

Definition



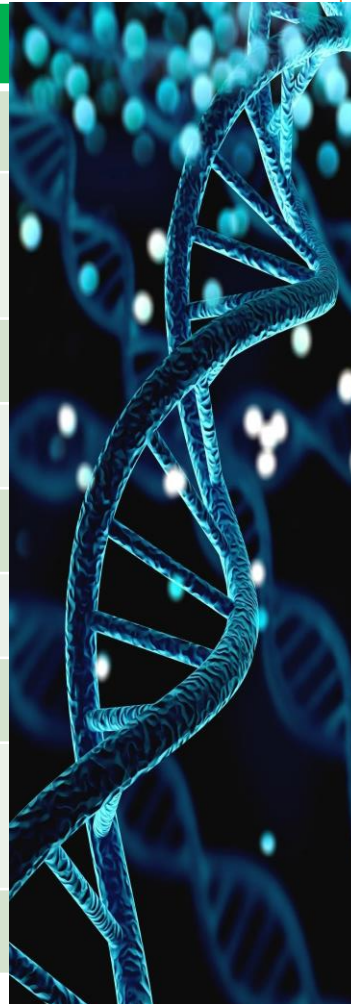
Causes






Different cancers and the genes involved

Gene involved	Inherited cancer	Non – inherited cancer
RBI	Retinoblastoma	Many different cancers
p53	Li- Fraumeni syndrome (sarcoma, brain tumors, leukemia)	Many different cancers
INK4a	Melanoma	Many different cancers
APC	Colorectal cancer	Most colorectal cancers
MLH1, MSH2, MSH6	Colorectal cancer	Colorectal, gastric, endometrial cancers
BRCA1, BRCA2	Breast and ovarian cancer	Only ovarian cancer
WT1	Wilm's Tumor	Wilm' s Tumor
NF1, NF2	Nerve tumors	Small number of colon cancer, melanomas, neuroblastoma
VHL	Kidney cancer	Certain types of kidney cancer












- ❖ Elimination of tobacco smoking / chewing
- ❖ Cessation of Alcohol
- ❖ Increase fruits and vegetables in diet
- ❖ Avoid junk and fast foods
- ❖ Increase physical activity
- ❖ Reduced exposure to air pollution
- ❖ Reduced risk of exposure to HPV, HCV and other viruses
- ❖ Early screening for cancer

❖ Breast self examination



BREAST SELF EXAMINATION



By Looking	By Touching	While Lying Down
<p>Stand before a mirror and look at both breasts and nipples.</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p>Once with both arms beside your body</p> </div> </div> <div style="display: flex; align-items: center; margin-top: 10px;">  <div style="margin-left: 10px;"> <p>Once with both hands on your hips</p> </div> </div> <div style="display: flex; align-items: center; margin-top: 10px;">  <div style="margin-left: 10px;"> <p>Once with both arms raised and arms behind your head</p> </div> </div>	<p>Raise your left arm. Use the pads of your 3 or 4 fingers of the right hand to examine your left breast. Repeat on the right side.</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p>Once in lines up and down your breast from outside to inside</p> </div> </div> <div style="display: flex; align-items: center; margin-top: 10px;">  <div style="margin-left: 10px;"> <p>Once in circles around the breast making smaller circles towards the nipples</p> </div> </div> <div style="display: flex; align-items: center; margin-top: 10px;">  <div style="margin-left: 10px;"> <p>Once in wedges starting from outside towards nipples and back again</p> </div> </div>	<p>Lie on your back, left arm over your head and a pillow under your left shoulder. Examine your left breast with your right hand as described before. Repeat for the right side. This position flattens the breast and makes it easier to examine.</p> <div style="display: flex; align-items: center; margin-top: 10px;">  </div> <p style="text-align: center;">Lymph Nodes</p> <p>Place your left hand on your waist. With your right hand try to find enlarged lymph nodes in the left underarm area and around your left collar bone. Repeat on the right side.</p> <div style="display: flex; align-items: center; margin-top: 10px;">  <div style="margin-left: 10px;"> <p>An enlarged lymph node feels like a corn kernel or a bean</p> </div> </div>

#together_we_are_ready

❖ Testicular self examination

Testicular Self-Exam



cup one testicle at a time using both hands
best performed during or after a warm bath or shower



3.

familiarize yourself with the spermatic cord & epididymis
tube like structures that connect on the back side of each testicle

**t. Testicular
Cancer
Awareness
Foundation**

examine by rolling the testicle between thumb and fingers
use slight pressure



2.

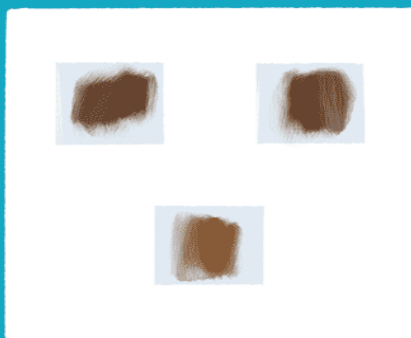
feel for lumps, change in size or irregularities
it is normal for one testis to be slightly larger than the other

4.



Types of Fecal Occult Blood Tests

1. Guaiac smear test



Collect 3 stool samples

Smear on card, send to lab

Color-changing chemical
detects blood

2. Fecal immunochemical test



Collect 1-3 stool samples

Smear on card, send to lab

Antibodies detect blood

3. Flushable reagent pad



Place a pad in toilet 3
days in a row

Pad changes color if
blood is detected

Record results yourself

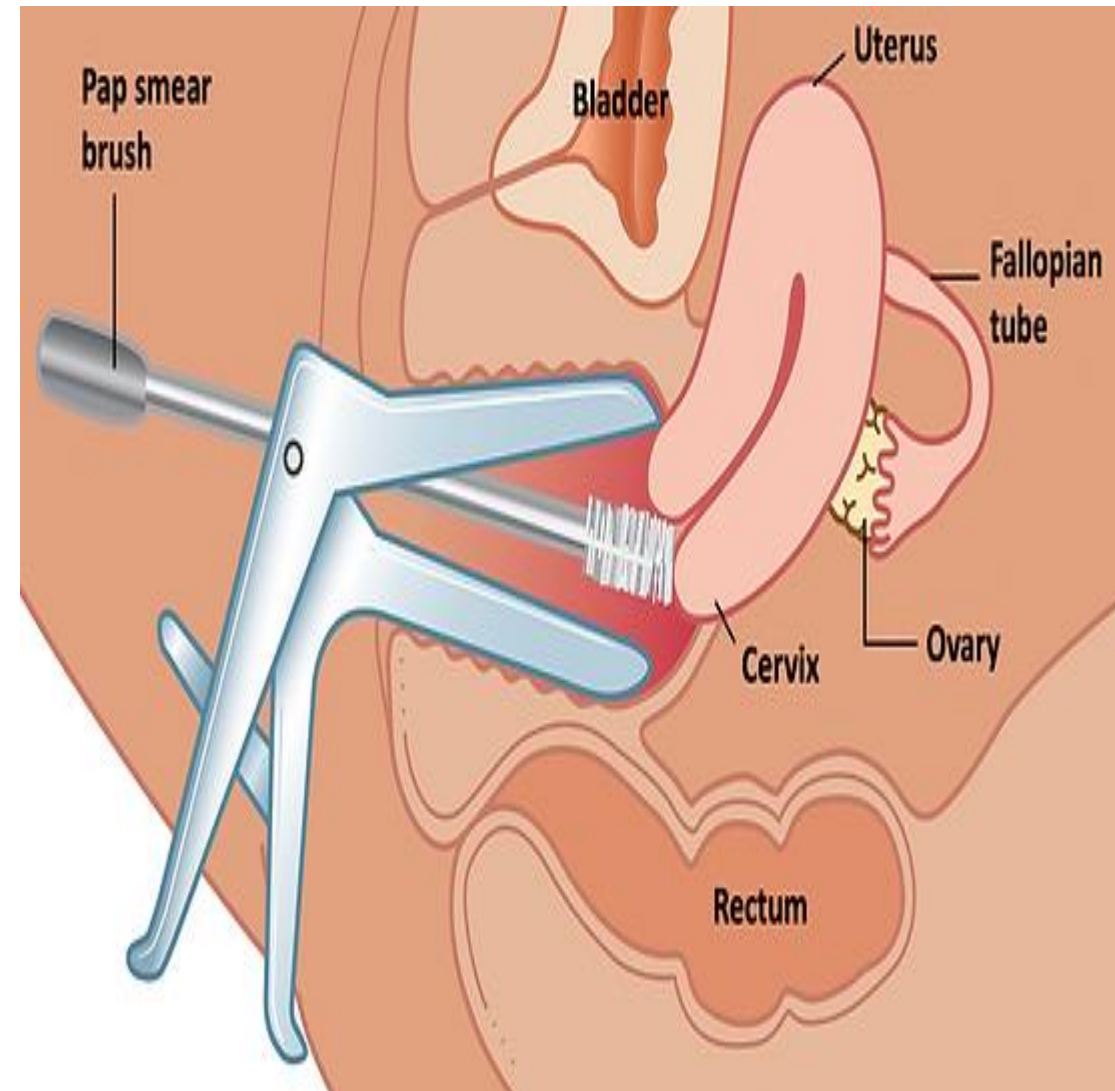


✓ Endoscopy

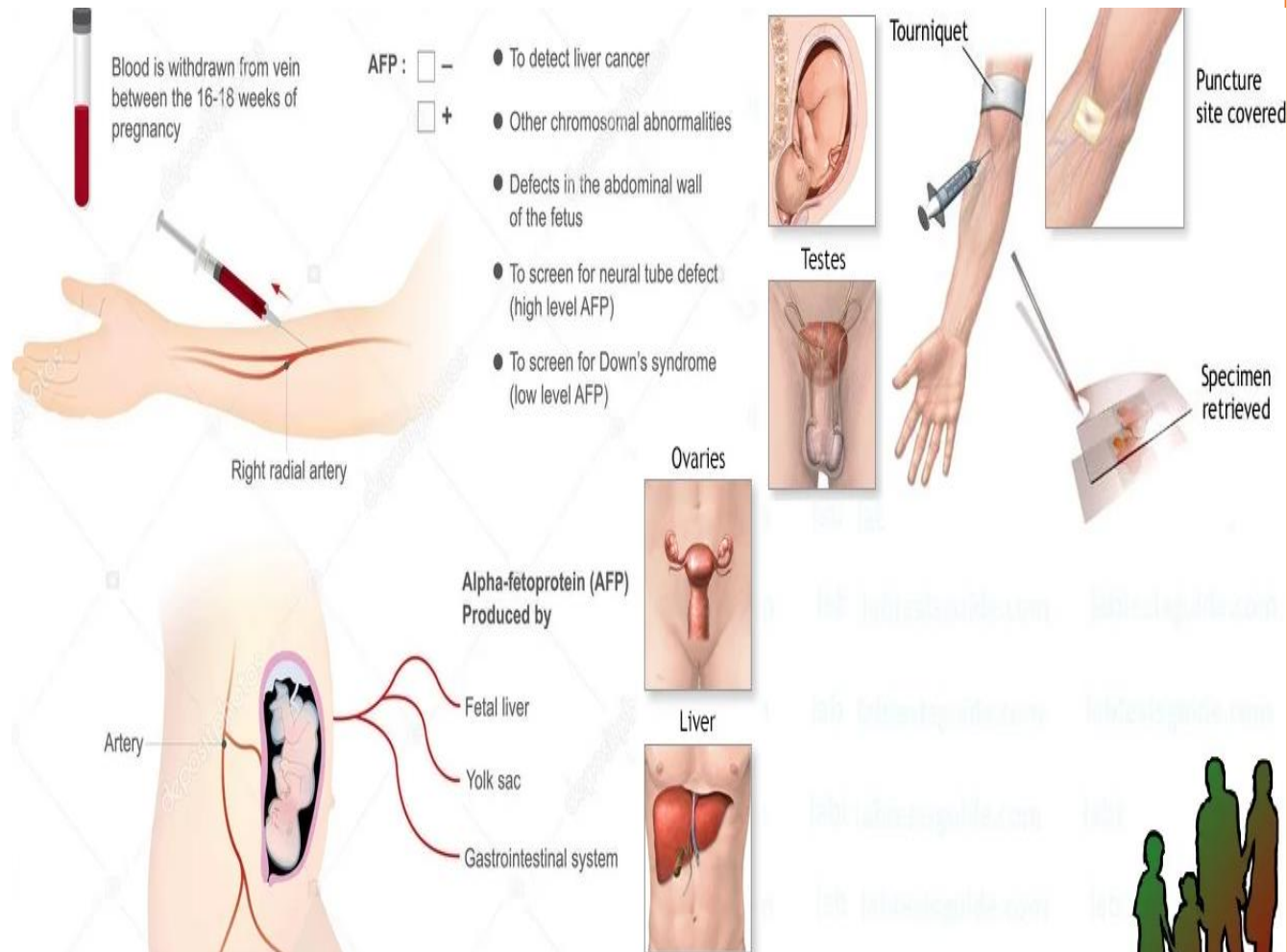
Endoscopy is a nonsurgical procedure that can be used to examine the digestive tract.

Pap smear:

A procedure in which a small brush is used to gently remove cells from the surface of the cervix and the area around it so they can be checked under a microscope for cervical cancer or cell changes that may lead to cervical cancer.



Early screening



Cancer markers:

AFP- Alpha Feto Protein

PSA- Prostate Specific Antigen

CEA- Carcinoembryonic Antigen

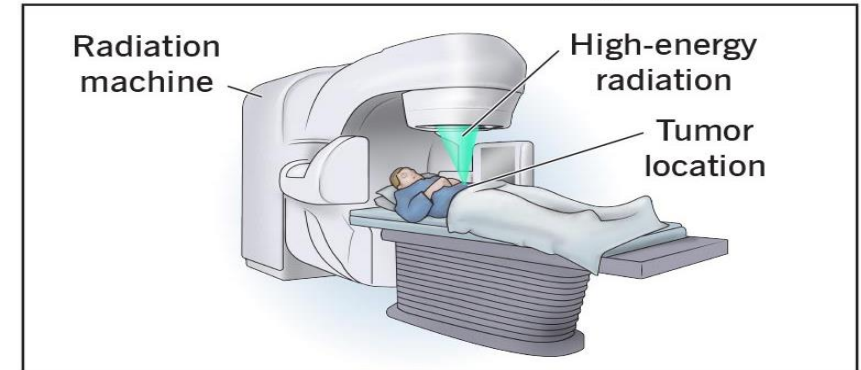
Surgery

- Non hematological cancer can be cured by surgery.
- It depends on the metastasis involved or not.
- Surgery can be performed for curative and palliative.

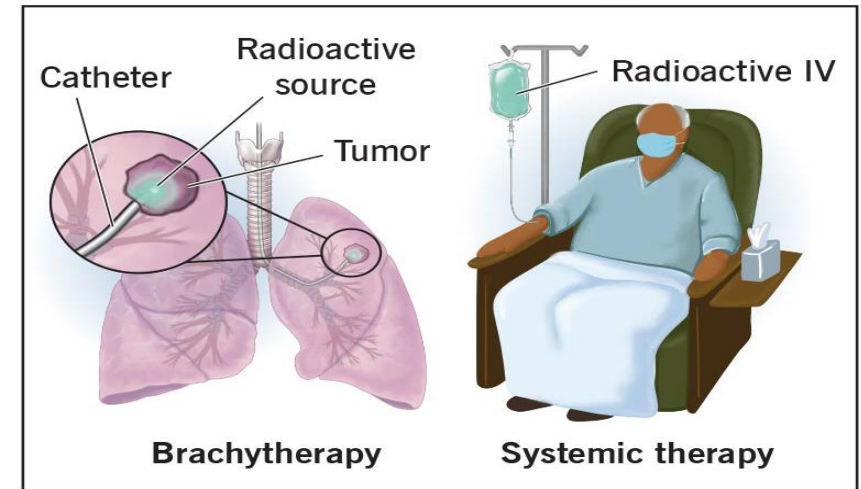
Radiation therapy

- It is the treatment that uses radiation (usually high-powered X-rays) to kill cancer cells.
- Radiation therapy may be used independently or alongside other treatments, like surgery or chemotherapy.
- **Types of EBRT:**
 - 3D conformal radiation therapy
 - Intensity-modulated radiation therapy (IMRT)
 - Arc-based radiotherapy
 - Image-guided radiotherapy (IGRT)
 - Particle therapy
 - Stereotactic radiosurgery, such as Gamma Knife surgery.
 - Stereotactic body radiation therapy (SBRT)
 - Intraoperative radiation (IORT)

External beam radiation therapy (EBRT)



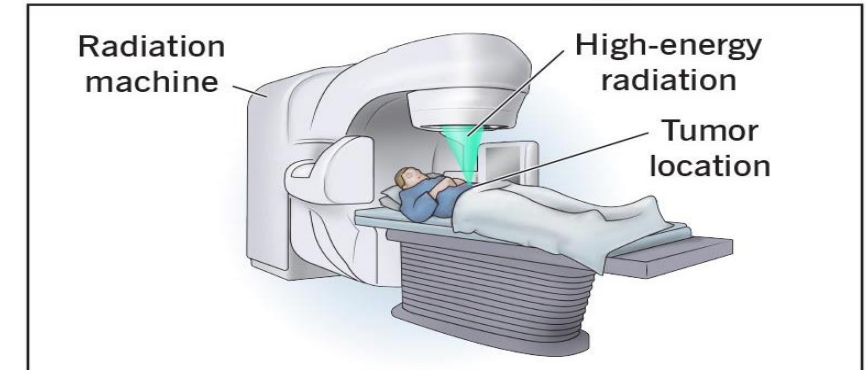
Internal radiation therapy



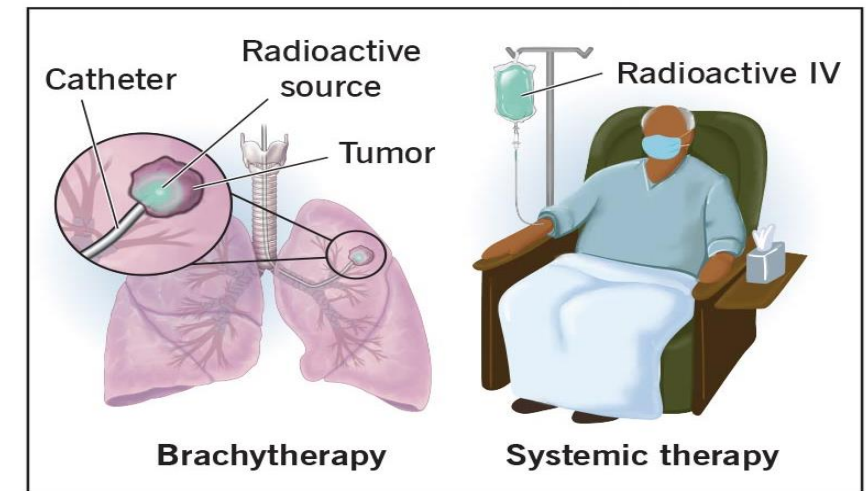
- **Types of Internal Radiation therapy:**

- ✓ **Brachytherapy** implants a solid radioactive source, or “seed,” inside or beside a tumor.
- ✓ **Systemic therapy** sends liquid radioactive material through the blood to find and destroy cancer cells. Some forms are swallowed.
- ✓ For others, they will receive an injection through a vein (IV).
- ✓ Treatments include radionuclide therapy (radioimmunotherapy).

External beam radiation therapy (EBRT)



Internal radiation therapy



What is Chemotherapy?

Chemotherapy is a form of cancer treatment in which chemicals are used to kill cancer cells. It is frequently used as the main form of cancer treatment



- ❖ Induction chemotherapy
- ❖ Combined modality chemotherapy
- ❖ Consolidation chemotherapy
- ❖ Combination chemotherapy involves treating a person with a number of different drugs simultaneously.
- ❖ Neoadjuvant chemotherapy is given prior to a local treatment such as surgery, and is designed to shrink the primary tumor
- ❖ Adjuvant chemotherapy is given after a local treatment (radiotherapy or surgery). It can be used when there is little evidence of cancer present, but there is risk of recurrence
- ❖ Maintenance chemotherapy is a repeated low-dose treatment to prolong remission.
- ❖ Salvage chemotherapy or palliative chemotherapy is given without curative intent, but simply to decrease tumor load and increase life expectancy.

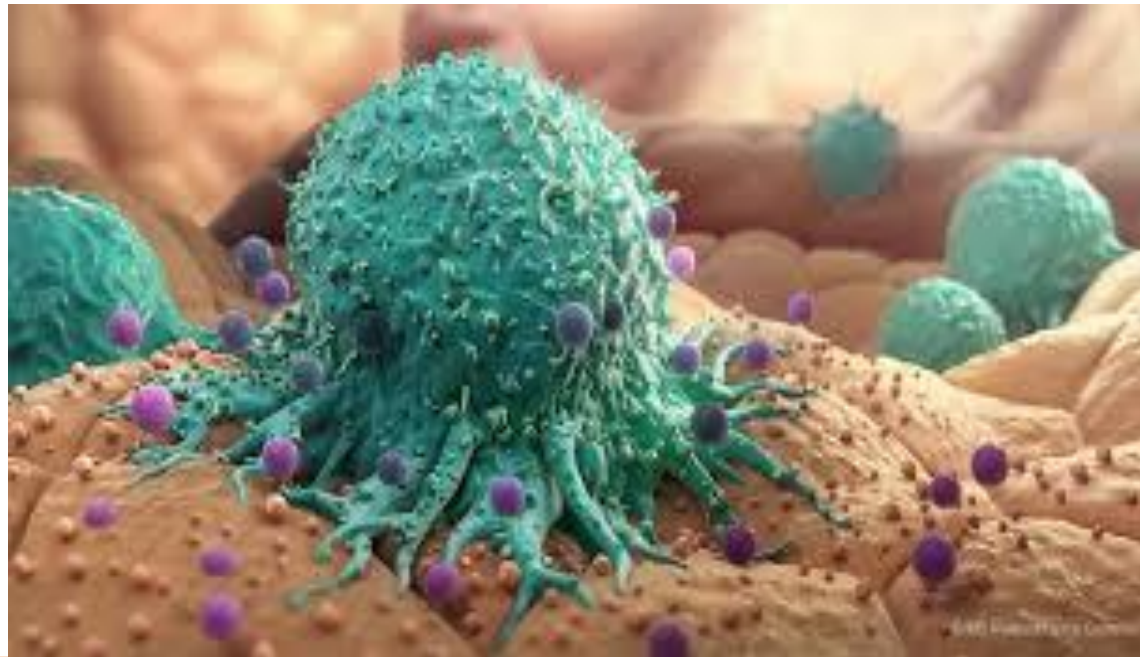
Chemotherapy

Cancer type	Drugs	Acronym
Breast cancer	Cyclophosphamide , methotrexate , 5-fluorouracil , vinorelbine	CMF
	Doxorubicin , cyclophosphamide	AC
Hodgkin's lymphoma	Docetaxel , doxorubicin , cyclophosphamide	TAC
	Doxorubicin , bleomycin , vinblastine , dacarbazine	ABVD
	Mustine , vincristine , procarbazine , prednisolone	MOPP
Non-Hodgkin's lymphoma	Cyclophosphamide , doxorubicin , vincristine , prednisolone	CHOP, R-CVP
Germ cell tumor	Bleomycin , etoposide , cisplatin	BEP
Stomach cancer ^[5]	Epirubicin , cisplatin , 5-fluorouracil	ECF
	Epirubicin , cisplatin , capecitabine	ECX
Bladder cancer	Methotrexate , vincristine , doxorubicin , cisplatin	MVAC
Lung cancer	Cyclophosphamide , doxorubicin , vincristine , vinorelbine	CAV
Colorectal cancer	5-fluorouracil , folinic acid , oxaliplatin	FOLFOX
Pancreatic cancer	Gemcitabine , 5-fluorouracil	FOLFOX
Bone cancer	Doxorubicin , cisplatin , methotrexate , ifosfamide , etoposide	MAP/MAP

Other therapies

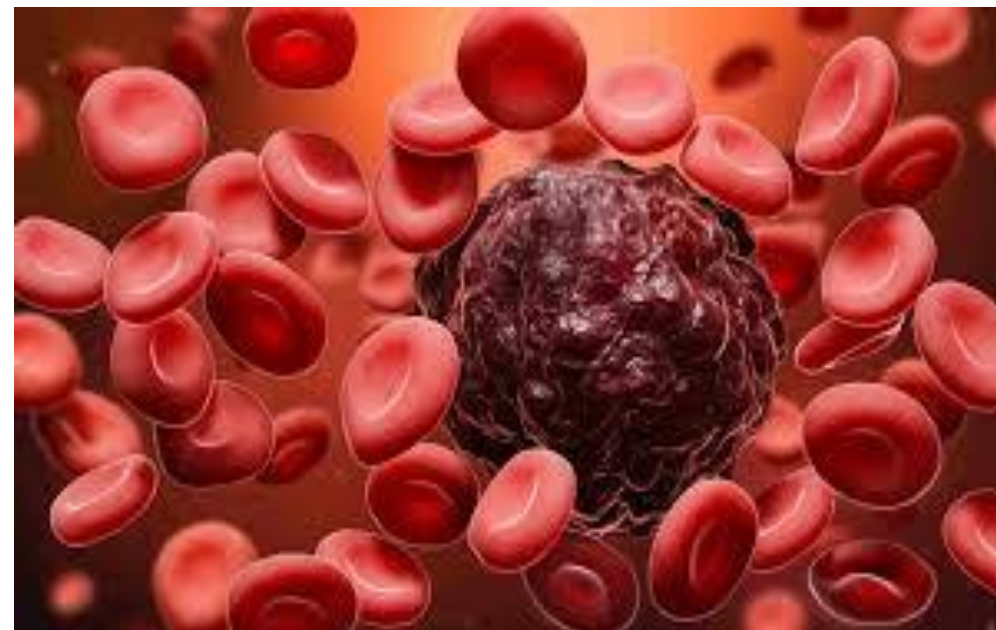
- Hormonal therapy, also known as endocrine therapy or hormone treatment, is a cancer treatment that can help slow or stop the growth of hormone-sensitive tumors.
- It's often used to treat breast and prostate cancer, but can also be used for other types of cancer.
- Immunotherapy is a cancer treatment that uses the body's immune system to fight cancer.
- It works by stimulating the immune system to improve its ability to identify and destroy cancer cells.
- Immunotherapy is a type of biological therapy, which uses substances made from living organisms to treat cancer.
- Angiogenesis inhibitors are drugs that prevent the growth of new blood vessels, which can help stop or slow the growth of tumors.
- They are also known as anti-angiogenic agents.
- Organ transplants- liver, lung.

- Cancer is a large group of diseases that can start in almost any organ or tissue of the body when abnormal cells grow uncontrollably, go beyond their usual boundaries to invade adjoining parts of the body and/or spread to other organs.



Cancer is more likely to be treated effectively and have a better chance of survival if it's detected early.

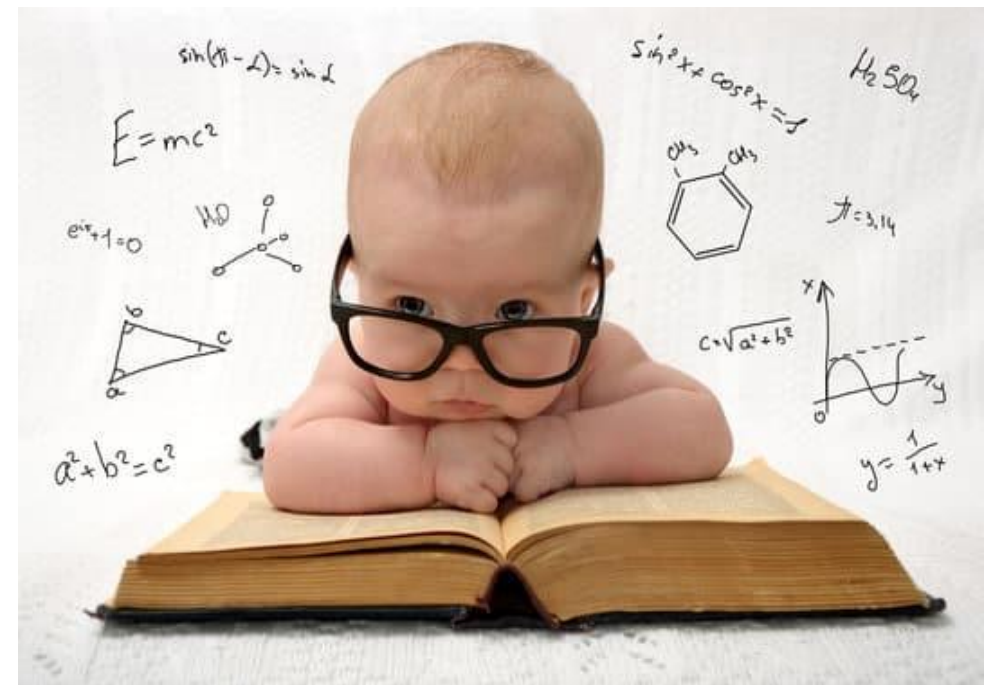
Early diagnosis identifies symptomatic cancer, while screening identifies people with abnormalities that may indicate cancer or pre-cancer, even if they don't have symptoms.



- ☐ Define Cancer.
- ☐ List out any 4 causes for cancer.
- ☐ Enumerate the prevention methods for cancer.
- ☐ Explain the screening technique for cancer
- ☐ Differentiate chemotherapy and radiation therapy.



- Suresh K Sharma Textbook of Pharmacology Pathology and Genetics for Nurses 2016 edition revised 2022 Jaypee publishers
- Suresh sharma Textbook of Pharmacology Pathology and Genetics for Nurses II 2nd edition Jaypee publishers
- Rimpi Bansal Textbook of Pathology and Genetics for BSc Nursing Students Sai publishers
- Chaitra K Textbook of Pathology and Genetics for BSc Nursing Students 1st edition Jaypee publishers
- Sonal Sharma Textbook of Pathology and Genetics for Nurses elsevier publishers



Thank you all!

