Cause of cancer

- Certain herpes and papilloma group DNA viruses and type C RNA viruses have also been implicated as causative agents in animal cancers and are responsible for some human cancers.

- Oncogenic RNA viruses contain reverse transcriptase enzyme that permits translation of the RNA message of the tumor virus into the DNA code of the infected cell.

- Thus become stable in host.
For other forms of cancer chemotherapy provides palliative (relieving and soothing the symptoms of disease without providing any cure) rather than curative therapy.

Effective palliation results in temporary improvement of the symptoms and signs of cancer.
• Promising agents that do not have excessive toxicity are advanced to phase 1 clinical trials

• Tested in patients with advanced cancer
Effectiveness

• tolerable dosing of an effective drug is capable to kill some of the tumor cells

• There may be cells that reside in pharmacologic sanctuary sites e.g. CNS and testes where effective drug concentrations may be difficult to achieve
CCS

- Effective in hematologic malignancies and in solid tumors in which a large proportion of the cells are proliferating or in the growth fraction.
Breast cancers express estrogen receptors or progestrone receptor retain intrinsic hormonal sensitivities of normal breast including growth-stimulatory response to ovarian, adrenal and pituitary hormones.

Patients with ablative procedures respond to addition of tamoxifen.
• Stage 4 - advanced cancer
• Metastasized to other parts of the body
• Most often lungs, brain, bones, liver
Primary resistance

- Malignant melanoma
- Renal cell cancer
- Brain cancer
- Absence of response on the first exposure
- Associated with genomic instability
Acquired resistance

• Amplification or increased expression of one or more specific genes

• Multidrug resistance phenotype occurs—resistance to a variety of anticancer drugs of differing structures after exposure to a single agent

• Increased expression of normal gene MDR1 gene for a cell surface glycoprotein

• Expressed in epithelial cells of kidney, large intestine and adrenal gland
• Increases resistance to natural product drugs such as antracyclines, vinca alkaloids, taxanes and epipodophyllotoxins by functioning as a drug export pump

• Multidrug resistance can be reversed by calcium channel blockers such as verapamil