

Abnormal Mitosis

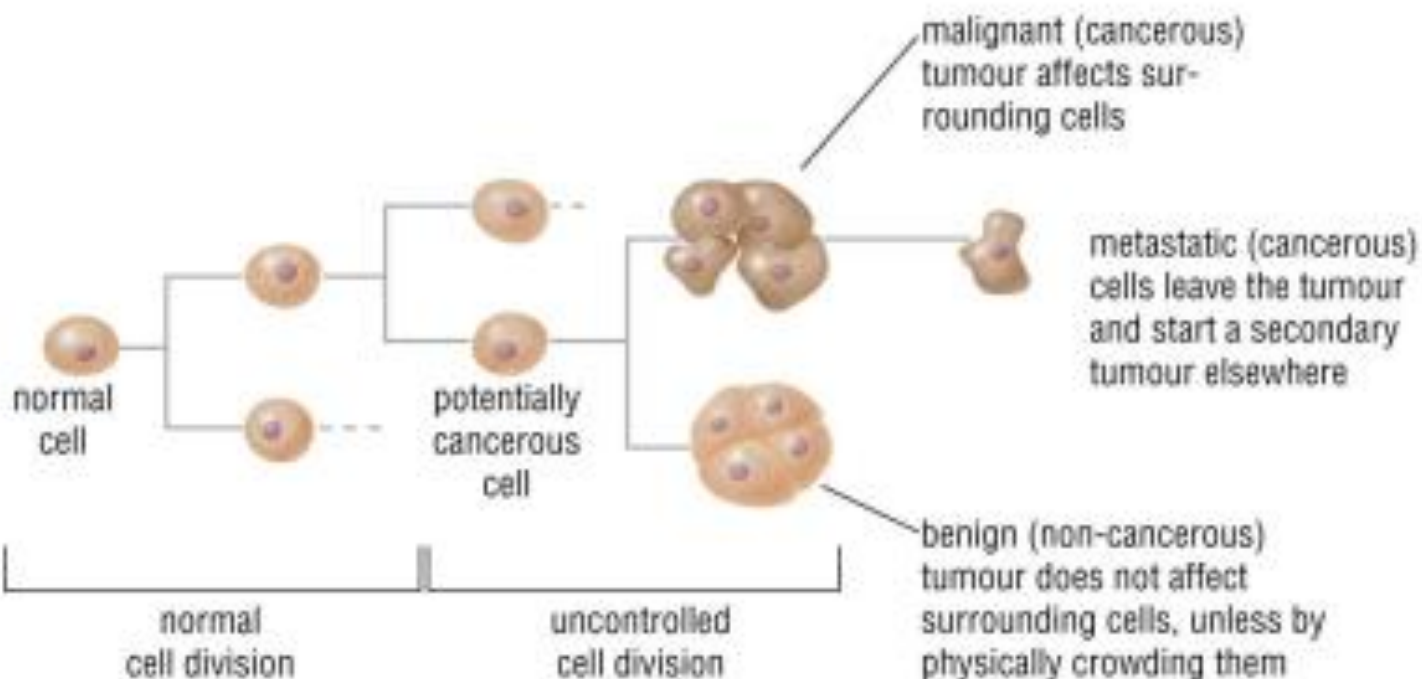
CANCER

WHAT IS CANCER?

- ① Cancer is a group of diseases that is characterized by the unregulated and uncontrolled division of cells
- ① There is a change or mutation in the DNA that leads to a cell not remaining in interphase for as long as it should.
- ① The normal checkpoints fail and the cell undergoes mitosis sooner than it should.

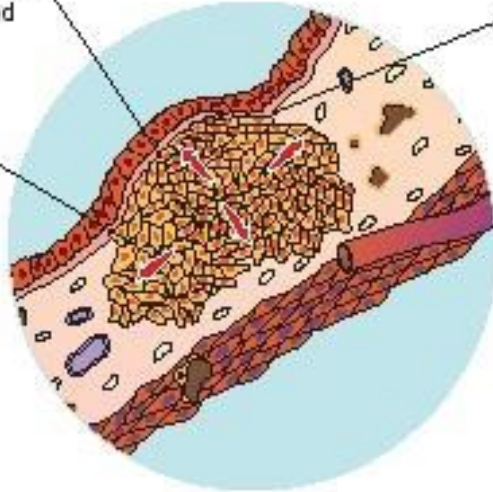
TUMOURS

- ⦿ When cells undergo mitosis uncontrollably, they form lots of cells that start to pile up on each other and a mass is formed called a **tumour**.
- ⦿ There are two types of tumours:
 - **Benign:** The cells in this tumour may crowd other cells, but is not cancerous.
 - **Malignant:** This is a cancerous tumour. The cells in this tumour can break away and start growing in another place and create a secondary tumour. This process is called **metastasis**.



Benign tumors are generally self-contained and localized and have a well-defined perimeter.

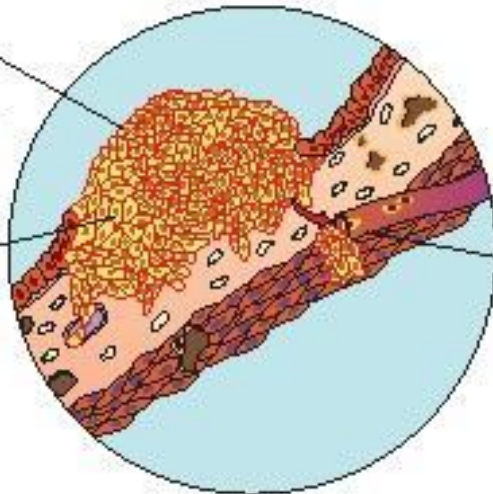
They grow slowly, expanding outward from a central mass.



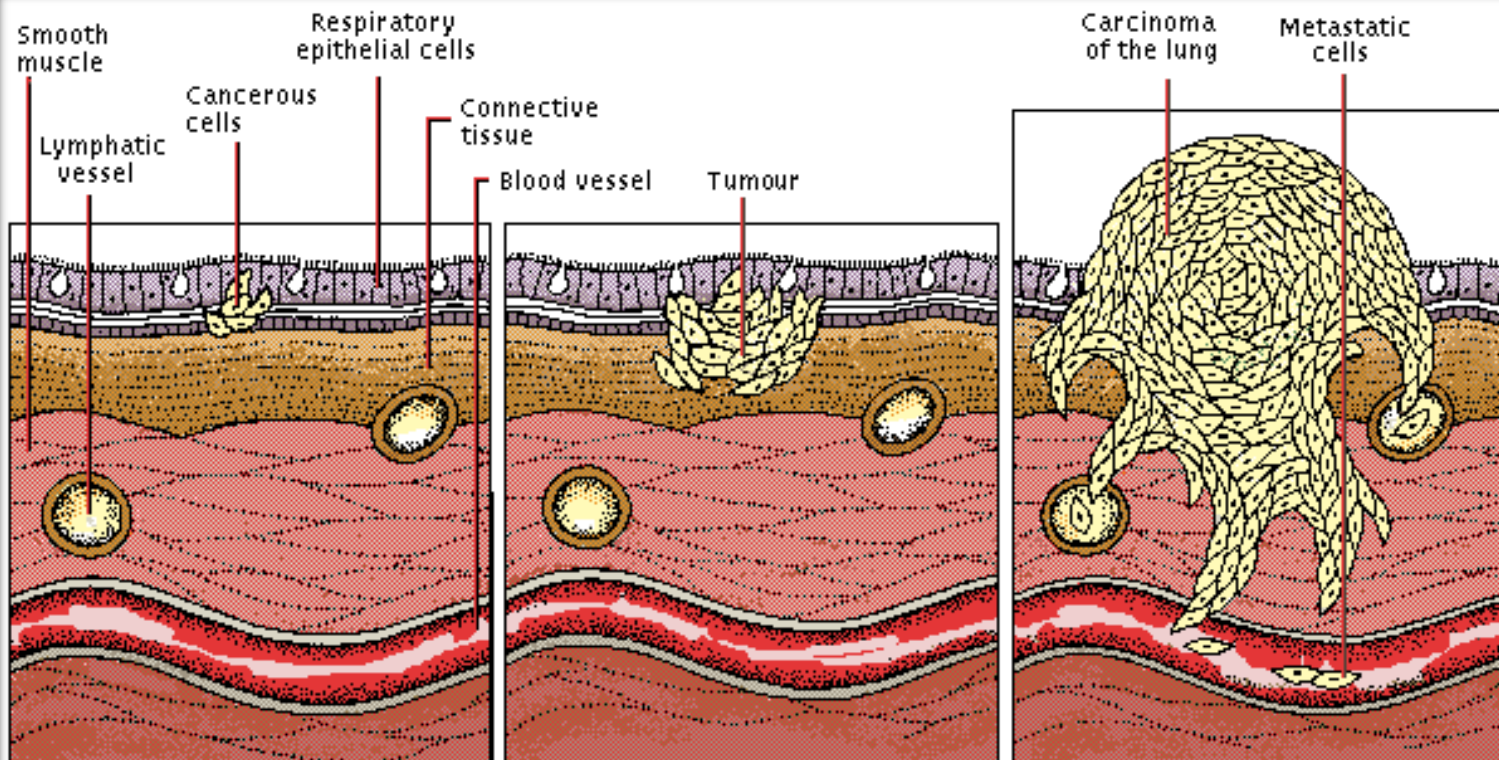
They are dangerous when they compress surrounding tissues. A benign tumor near a blood vessel could restrict the flow of blood; in the abdomen it could impair digestion; in the brain it could cause paralysis.

Malignant tumors are not self-contained, and usually do not compress surrounding tissues. Their growth is an irregular invasion of adjacent cells.

Although they may grow slowly, they are also capable of very rapid growth.



They are not localized; in a process called metastasis they shed cells that travel through the bloodstream and infect tissues at other locations. They can even establish malignant growth in a different type of tissue; a breast cancer can spread to bone tissue, for example.



Healthy cells with few cancerous cells

Multiplication of cancerous cells

Metastasized cells

MUTATIONS

- Chromosomes usually duplicate themselves without mistakes and the daughter cells are identical to the parent cells.
- Sometimes random changes occur in the DNA. These changes are called **mutations**. Mutations can be helpful, harmful or have no affect whatsoever. If the changes cause the cell to have an abnormal cell cycle, the cell may become cancerous.

CARCINOGENS

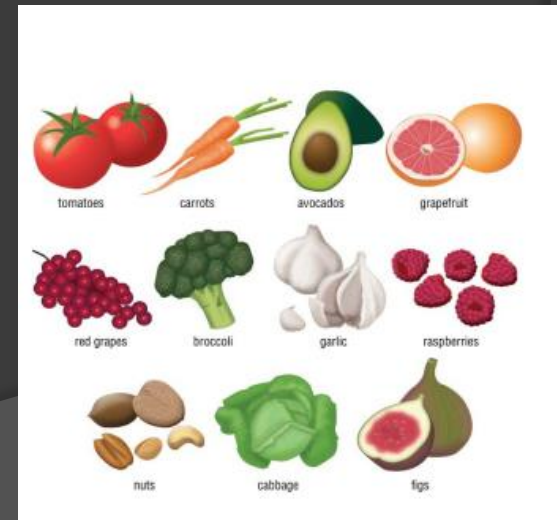
- Some mutations are caused by environment factors.
- Carcinogens are environmental factors that leave you at greater risk to developing cancer. They include things like: radiation, tobacco smoke, some viruses, certain chemicals and some organic solvents.
- Some cancers are at least partially hereditary like breast, prostate and colon cancers. Individuals with family members with these cancers must be tested early.



Tobacco, whether smoked, chewed or sniffed, contains nicotine, which is highly addictive, and contains over 19 carcinogens, and 4000 chemicals

RISK FACTORS

- ◎ Certain factors may increase your risk of getting cancer such as:
 - Family medical history
 - Exposure to carcinogens
 - Lifestyle choices – smoking, diet



SCREENING

- ⦿ Screening means checking for cancer even when there are no symptoms present.
- ⦿ Screening can be:
 - At home as part of a routine self examination
 - By a doctor, like a pap test or blood test
 - Genetic testing when there is a family history
- ⦿ Screening does not prevent cancer, but it increases early detection which is important for successful treatment.

DIAGNOSIS

- ⦿ Some diagnostic imaging test that are used to identify abnormalities include:
 - Ultrasound, endoscopy X-ray, CT scanning, MRI
- ⦿ When an abnormality is detected, cells are extracted and examined under a microscope in a test called a biopsy.
- ⦿ A biopsy is the only way to positively confirm a cancer diagnosis.



TREATMENT

- ⦿ The purpose of cancer treatment is to slow down the growth and spread of cancer cells and to kill as many as possible
- ⦿ Conventional cancer treatments include:
 - Surgery
 - Chemotherapy
 - Radiation therapy

