

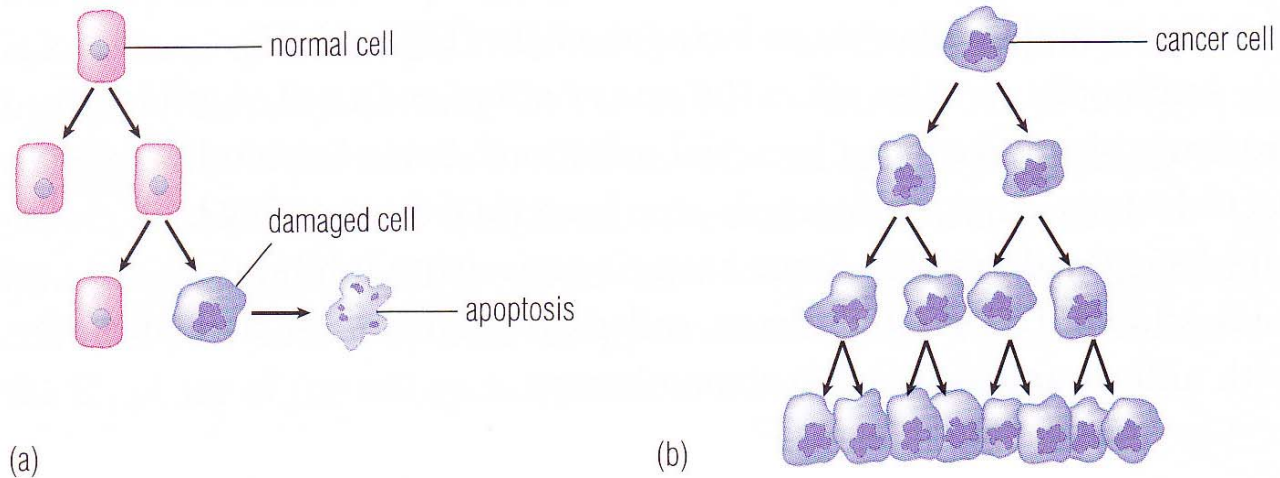


# L6 Cancer

# Comparing Normal Cells and Cancer Cells

- **Normal cells** grow and divide, and eventually die.
- **Cancer cells** just continue to grow and divide.

# Normal Cells vs. Cancer Cells



**Figure 1.34** (a) Cell division and cell death in normal cells (b) Cell division in cancer cells

# Normal Cells vs. Cancer Cells

**Table 1.4** Comparing Normal Cells with Cancer Cells

Normal Cells	Cancer Cells
<ul style="list-style-type: none"><li>• make exact copies of themselves through mitosis</li></ul>	<ul style="list-style-type: none"><li>• make exact copies of themselves through mitosis</li></ul>
<ul style="list-style-type: none"><li>• reproduce for about 50–60 cell divisions</li></ul>	<ul style="list-style-type: none"><li>• do not stop reproducing</li></ul>
<ul style="list-style-type: none"><li>• stick together to form masses of cells as appropriate</li></ul>	<ul style="list-style-type: none"><li>• do not stick to other cells</li><li>• behave independently</li></ul>
<ul style="list-style-type: none"><li>• self-destruct when too old or too damaged</li></ul>	<ul style="list-style-type: none"><li>• may move to another location of the body</li></ul>

- Tumor is a Latin word.
- The uncontrolled cell division is called tumour.
- These are of two kinds:
  - benign tumour
  - malignant tumour

## Benign tumour

- will not spread.
- is covered by connective tissues
- Can be removed by surgery

## Malignant tumour

- is contagious tumour
- can spread organ to organ through uncontrolled cell division - is called cancer or malignancy. The person becomes weak, loses appetite and may ultimately die.

- Cancer is caused by mutations.

Three types of cancer:

- carcinoma cancer – affects epithelial cells; e.g. lungs, breast, pancreas, stomach
- sarcoma cancer – affects tissues; e.g. muscle, lymph nodes
- leukemia – affects blood cells; e.g. white blood cells

# Kinds of Tumours

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graph TD; A[Kinds of Tumours] --> B[Benign tumour]; A --> C[Malignant tumour]; B --> D[No serious effect on the normal cells around it.]; C --> E[Interferes with the work of other cells around it or destroys those cells];
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Benign tumour

No serious effect on the normal cells around it.

Malignant tumour

Interferes with the work of other cells around it or destroys those cells



# Causes of Cancer

- Cancer can be inherited or caused by **carcinogens** or **lifestyle choices** such as diet and exposure to tobacco smoke.
- Carcinogens are factors in the **environment**, such as UVA, UVB, and some **viruses**, that cause cancer.

Carcinogens  
-damage DNA  
-cause tumour

Tobacco

-Nicotine  
-Hydrogen cyanide  
-Carbon monoxide

Lung cancer

Diet

Colon cancer

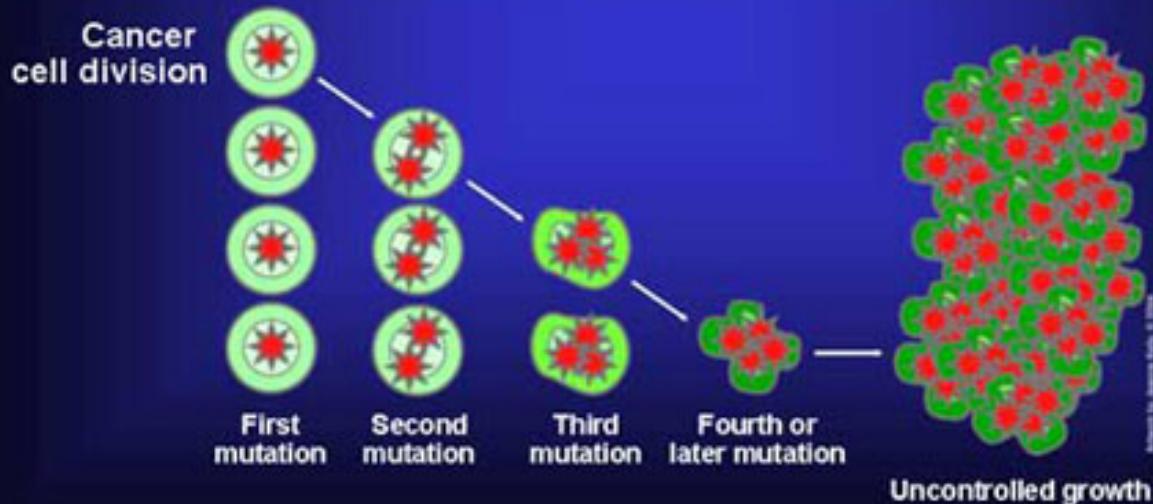
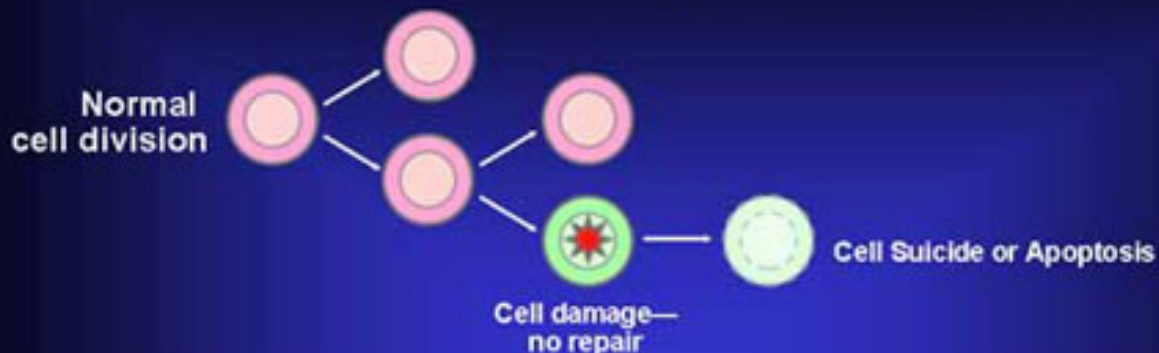
UV radiation  
-mutation in  
skin

Skin cancer

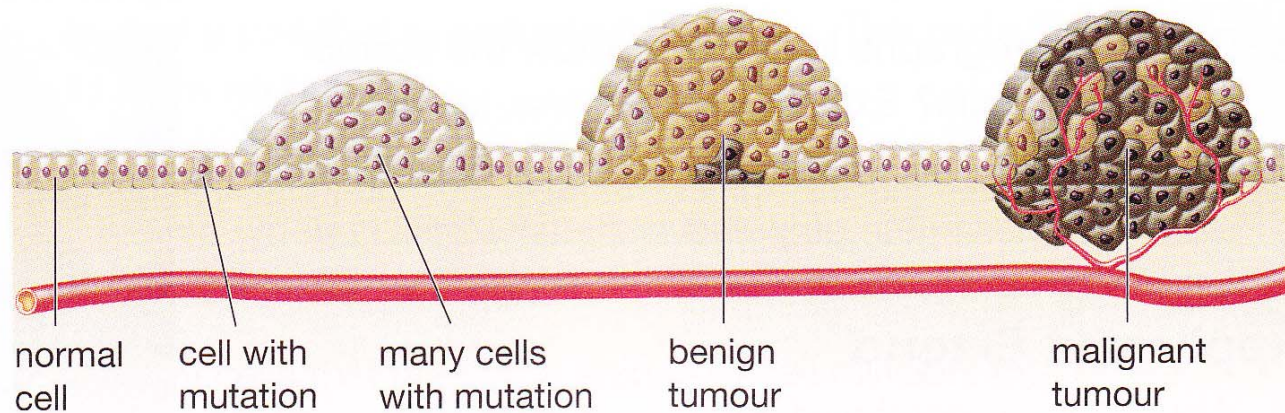
Viruses

Many kinds of  
cancer

# Loss of Normal Growth Control



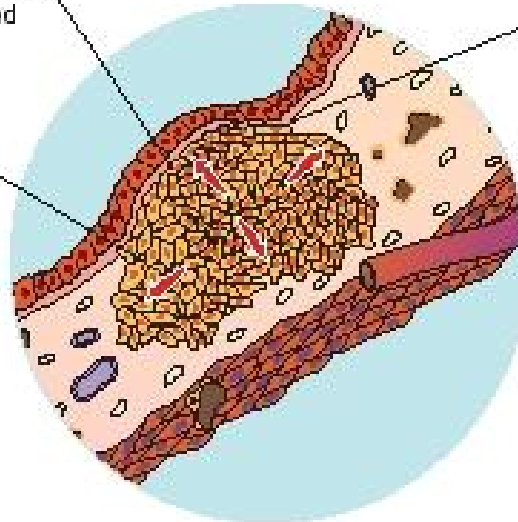
# Benign vs. Malignant Tumour



**Figure 1** Stages in the formation of a skin cancer tumour

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

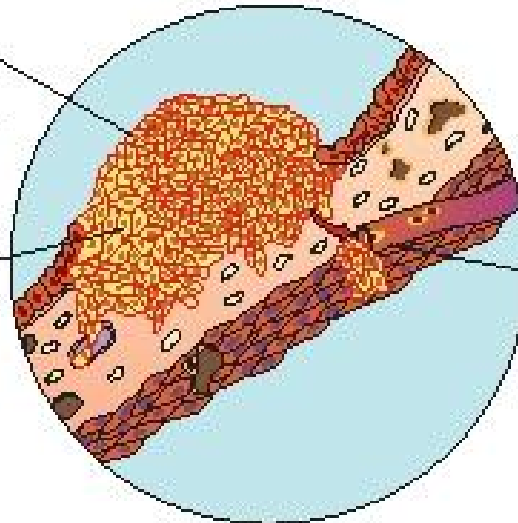
They grow slowly, expanding outward from a central mass.



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.

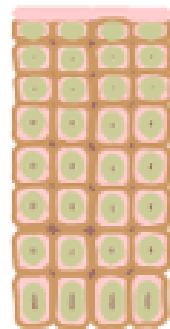
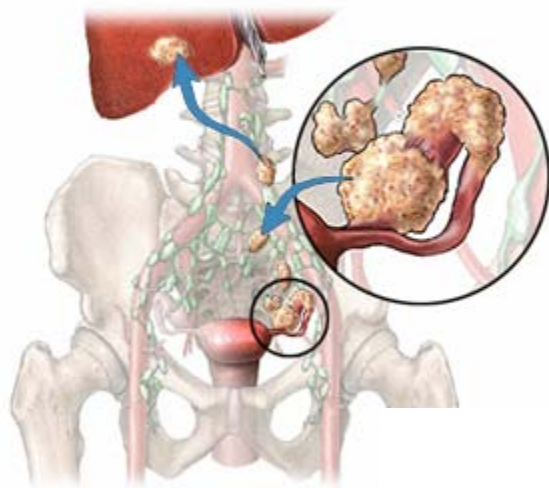
Malignant tumors are not self-contained, and usually do not compress surrounding tissues. Their growth is an irregular invasion of adjacent cells.

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

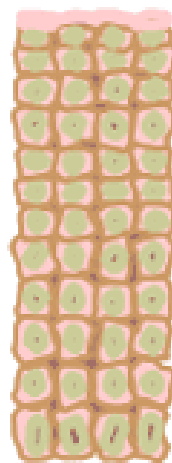


They are not localized; in a process called metastasis they shed cells that travel through the bloodstream and infect tissues at other locations. They can even establish malignant growth in a different type of tissue; a breast cancer can spread to bone tissue, for example.

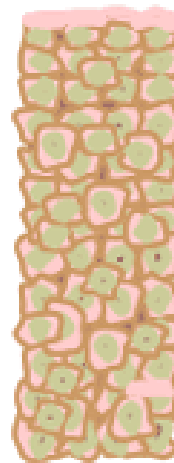
Cancer cells travel from the ovary to the lymph nodes and into other organs



Normal



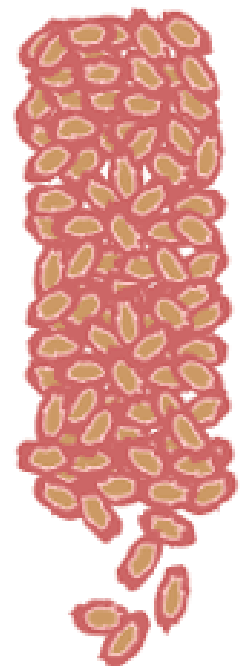
Hyperplasia



Mild  
dysplasia



Carcinoma in situ  
(severe dysplasia)



Cancer  
(invasive)

