

## Cancer: Cell Division Gone Wrong - 2.7

### Causes of Cancer

1. Mutations: When cells divide, there is a chance that changes or mutations in DNA can occur. Some of these affect cell division and create cancerous cells.
2. Carcinogens: these are factors in your environment that cause mutations in DNA  
ie: tobacco smoke, x-rays, sunlight, some viruses etc. Carcinogens increase the chance of cancer. Fig. 3 - all the organs at risk when you smoke!!
3. Hereditary: some genes may contain information that could lead to cancer. 'predisposition' to cancer.

### Cancer Screening

Early detection of cancer increases your odds of survival and beating it!

ie: Women - self exam - for breast cancer (lumps) + doctor checks @ physical exam

PAP test for cervical cancer

Men - self exam - for testicular cancer + doctor checks @ physical exam

Blood test for prostate cancer

Both - check appearance of moles on skin - ABCD's

### Lifestyle Choices

You can't change your DNA and often you can't change what is in your environment but you can always make better lifestyle choices!

- avoid tobacco smoke
- eat lots of fruits and vegetables
- focus on 'super foods' - those thought to lower your risk of cancer  
ie: tomatoes, carrots, avocados, grapefruit, red grapes, broccoli, garlic, raspberries, etc, cabbage and figs.

### Diagnosing Cancer

- some patients can feel tired
- there might be swelling or discomfort
- doctor might order a blood test (elevated WBC's)
- biopsy - a small sample is taken - examined under microscope
- imaging tests
  - endoscopy - small fibre inserted (with light & camera) - colon/throat cancer?
  - x-rays - to examine bones and lungs for cancer
  - mammogram - picture - breast cancer
  - ultrasound - sound waves - soft tissue - heart and liver
  - CAT scan - 3D x-ray - more information than x-ray, more radiation
  - MRI - radiowaves & magnetic field produce detailed image - brain cancer

## Treating Cancer

Goal → slow down growth or destroy tumour all together

1) Chemotherapy - drugs - injected or orally taken - get to all parts of body - even small, inaccessible areas. 1<sup>st</sup> option usually - shrink tumour 1<sup>st</sup>.

Side affects - nausea, hair loss and fatigue

Next... 2) Surgery - good if accessible and easily defined

..or.... 3) Radiation Therapy - radiation damages rapidly dividing cells (cancer!)

Chromosomes are damaged therefore no dividing!

Upcoming... 4) Biophotonics - pioneering at U. of Toronto. Uses light to detect and treat cancer. Fewer side affects - it's light!

**Homework:** pg. 55 # 5-10