Cannabinoids and Health

Module 8

Lecture 1: Cancer Overview

What Is Cancer?

- Cancer is the second leading cause of death

- Around one third of deaths from cancer are due to:
  - tobacco use
  - obesity
  - low fruit and vegetable consumption
  - lack of physical activity

9.6 million
people worldwide are estimated to die from cancer in 2018

Global Health Observatory

US$1.16 trillion
is the estimated total annual economic cost of cancer in 2010.

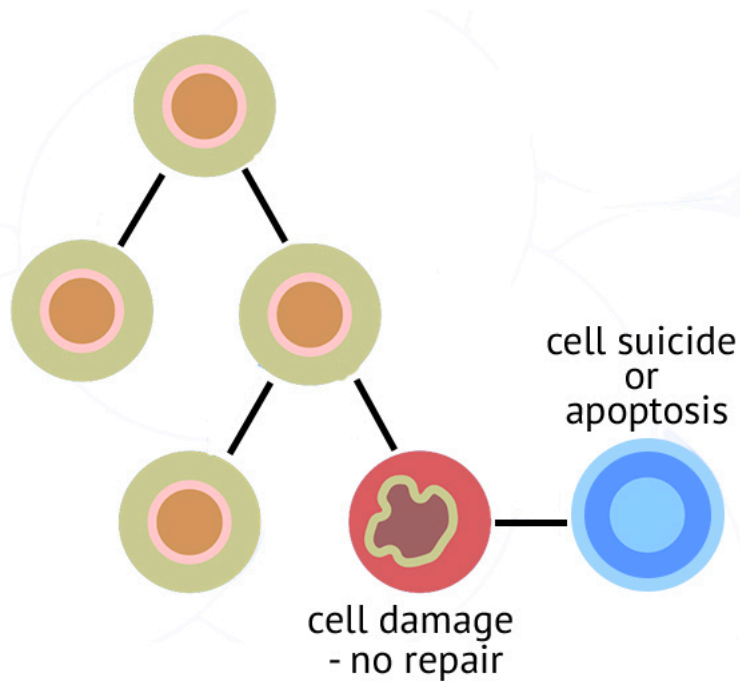Key facts about cancer

30-50%
of cancers could be prevented.

Read the fact file about cancer
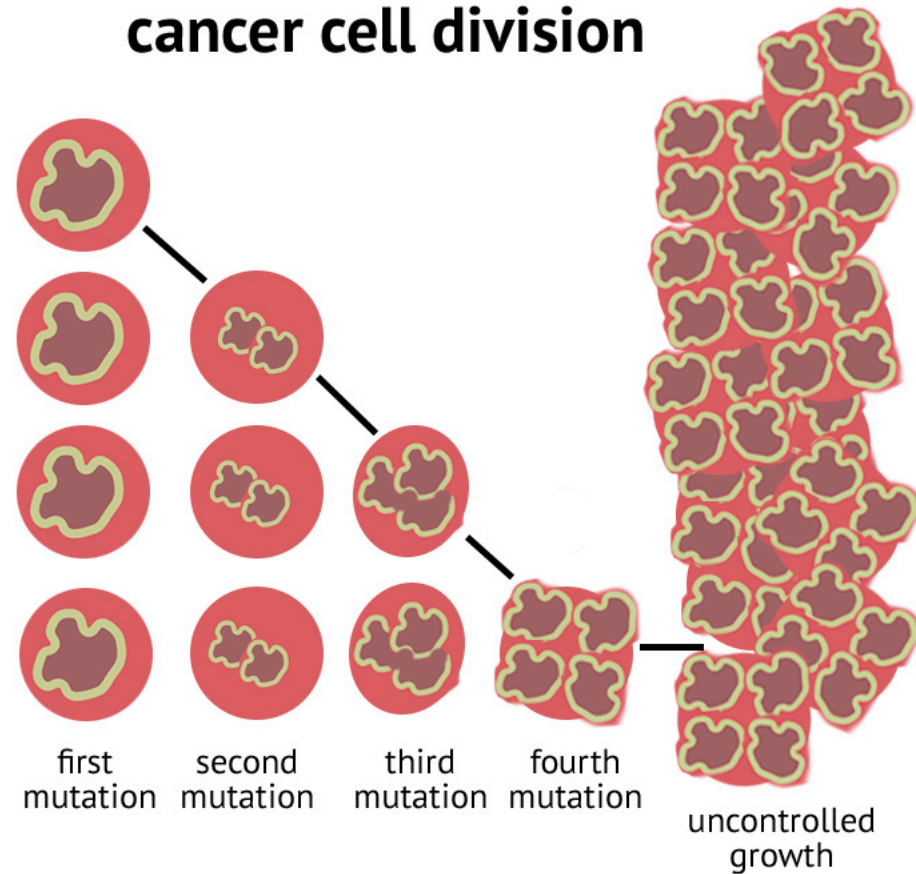
https://www.who.int/cancer/en/

What is Cancer?

- Cancer is a collection of related diseases, in which cells begin to divide without stopping

- Normally, human cells grow and new cells are formed as the body needs it

- When cancer develops, this process breaks down.
  - Old or damaged cells survive when they should die
  - New cells form when they are not needed
  - These extra cells divide without stopping and form tumors

https://www.cancer.gov/about-cancer/understanding/what-is-cancer

What is Cancer?

normal cell division

cell suicide or apoptosis

cell damage - no repair

cancer cell division

first mutation

second mutation

third mutation

fourth mutation

uncontrolled growth

What is Cancer?

- Some (but not all) tumors spread into, or invade, nearby tissues (i.e., malignant tumors)
  - Some cancer cells can break off and travel through the blood or the lymph system and form new tumors

- Benign tumors do not spread into, or invade, nearby tissues
  - When removed, benign tumors usually don't grow back and don't require further treatment.

https://www.cancer.gov/about-cancer/understanding/what-is-cancer

What Causes Cancer?

- Normal cells are turned into cancer cells when external agents cause gene mutations:
  - physical carcinogens (e.g., ultraviolet radiation);
  - chemical carcinogens (e.g., asbestos, components of tobacco smoke);
  - biological carcinogens (e.g., specific viruses, bacteria, or parasites)

- 30–50% of cancers can be prevented by avoiding risk factors and implementing existing evidence-based prevention strategies according to WHO

- Age is a fundamental risk factor for cancer – exposure to carcinogens accumulate over time, and cellular repair mechanisms become less effective

https://www.who.int/cancer/en/

Tobacco, alcohol, and cancer

- Tobacco smoking linked to 15 different cancers
- Alcohol use linked to 7 different types of cancer
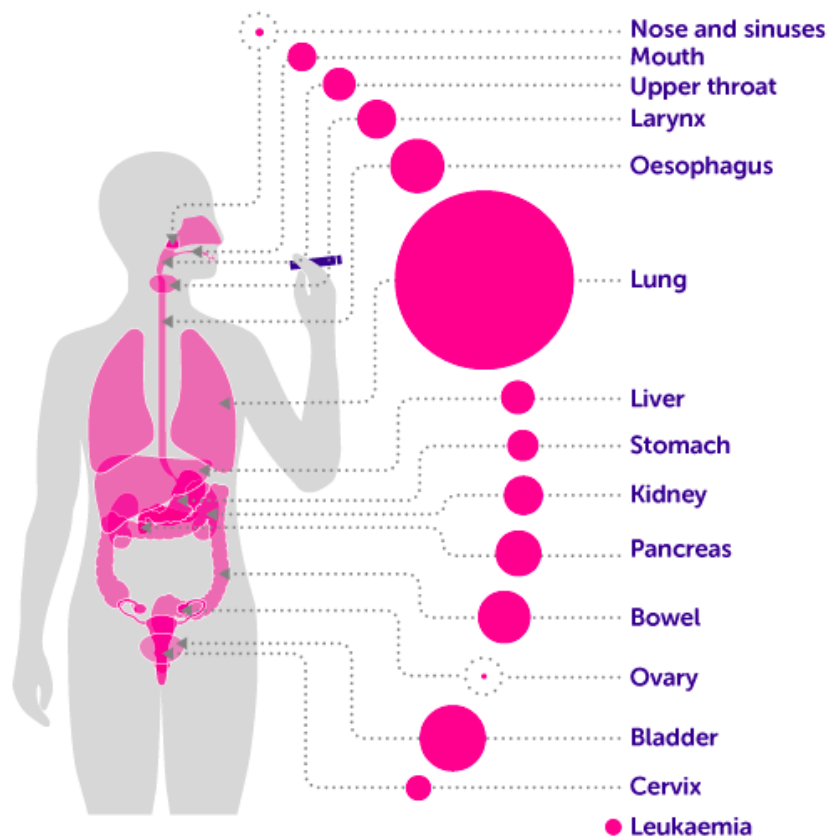
ALCOHOL CAN CAUSE 7 TYPES OF CANCER

Mouth & Upper throat

Larynx

Oesophagus

Breast in women

Liver

Bowel
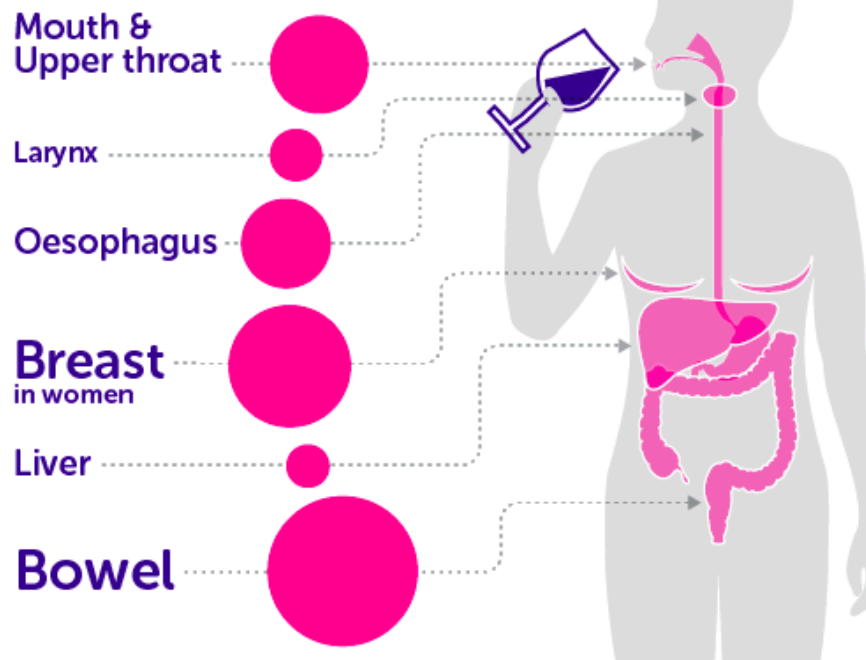
Larger circles indicate cancers with more UK cancer cases linked to drinking alcohol

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BEING SMOKE FREE CAN PREVENT 15 TYPES OF CANCER

Nose and sinuses
Mouth
Upper throat
Larynx
Oesophagus

Lung

Liver
Stomach
Kidney
Pancreas
Bowel
Ovary
Bladder
Cervix
Leukaemia

Larger circles indicate more UK cancer cases

Circle size here is not relative to other infographics based on Brown et al 2018.
Source: Brown et al, British Journal of Cancer, 2018
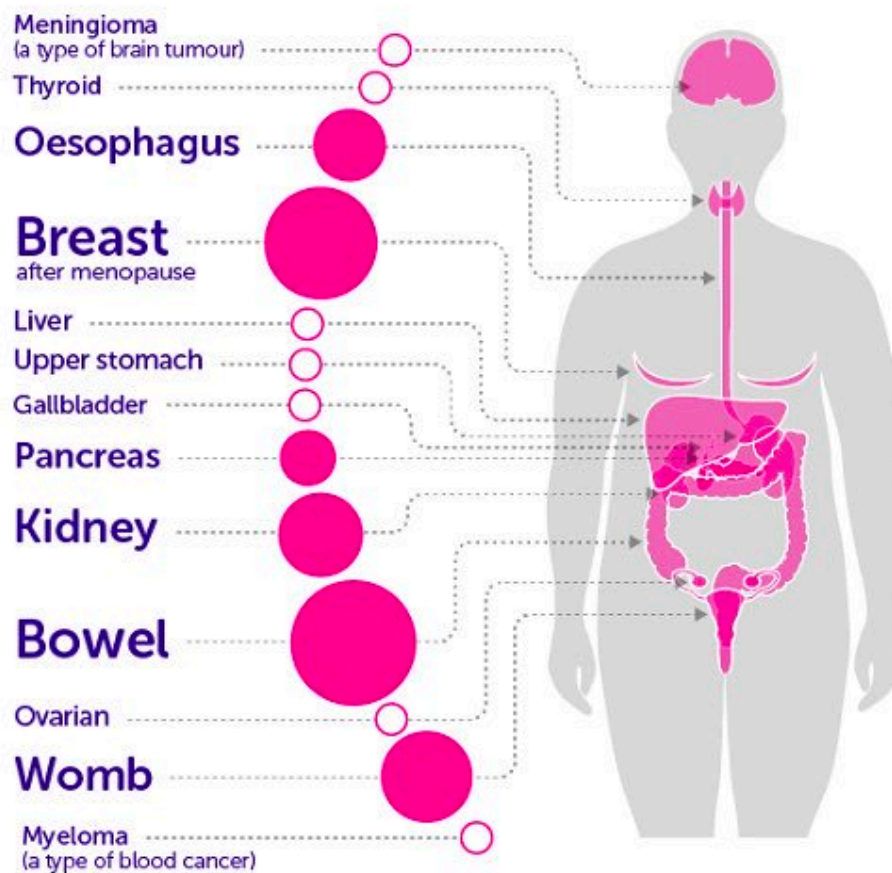
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BEING OVERWEIGHT CAN CAUSE 13 TYPES OF CANCER

●●● **Larger circles** indicate cancers with more UK cases linked to being overweight or obese

○ Number of linked cases are currently being calculated and will be available in 2017

Meningioma (a type of brain tumour)

Thyroid

Oesophagus

Breast after menopause

Liver

Upper stomach

Gallbladder

Pancreas

Kidney

Bowel

Ovarian

Womb

Myeloma (a type of blood cancer)

LET'S BEAT CANCER SOONER
cruk.org

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Cancer and Anxiety

- There is the initial shock, fear, and anxiety after diagnosis while you wait for your treatment plan
  - Thoughts of death elicit anxiety

- There is anxiety about the treatment plan (side effects, hair loss, pain, etc.)

- After successful treatment, there is anxiety about the return of cancer

- 1 in 3 patients will experience major mood disturbance

- Survivors much more likely to experience subsequent mood disturbance

- Treatments include traditional psychological interventions such as mindfulness and relaxation

https://www.cancercenter.com/integrative-care/anxiety-stress

Cancer and Pain

- Tumors may produce pain by putting pressure on bones, nerves, spine, organs, etc.

- Chemotherapy induced peripheral neuropathy
  - Mouth sores are often another problem

- Radiation can produce burns, mouth sores, etc.

- Surgery obviously can be the source of significant pain

- Procedures like lumbar puncture

Cancer and Sleep

- Sleep disruption is common
  - Difficulty falling asleep
  - Awakening in the middle of the night
  - Problems maintaining sleep
  - Insomnia

- Etiology varies by type of cancer and treatment
  - Pain may contribute
  - Nausea and vomiting may contribute

- Sleep problems can become chronic

- 30-50% of prescriptions are for hypnotics

Conclusions

- Cancer is second leading cause of death worldwide
  - ~ 9.6 million died in 2018

- 1/3rd of cancer cases are attributable to behavior and consumption of substances
  - ~25% to tobacco use
  - ~15% to obesity
  - ~5% to alcohol

- The following symptoms are common
  - Anxiety
  - Pain
  - Sleep Disturbance
  - Side effects from chemotherapy and radiation (which include the above)

- Treatment involves treating the cancer itself as well as the symptoms listed above