

Cancer

■ PSE, years 10 and 11



Background information

What is cancer?

Cancer occurs when the genetic information of the cell (DNA) is somehow damaged, with the result that the cell begins to multiply uncontrollably, making many more cancer cells. The cancer cells usually grow into a lump called a TUMOUR. There are two types of tumour:

1. Benign tumours grow slowly, are self limiting and do not spread through the body.
2. Malignant tumours contain cancer cells. They usually grow more rapidly than benign tumours and spread throughout the body via the blood vessels and lymphatic system. In this way, they invade other parts of the body, such as the liver, lungs and bone marrow, and make more tumours called METASTASES.

How is cancer caused?

The DNA of a cell may be damaged by chemicals, high-energy rays from radioactivity or ultraviolet radiation from the sun. It may also be altered if mistakes are made when DNA is copied in the cell. Most cells with altered DNA behave quite normally and are often able to repair the damage. If the damage is really serious, the cell will self destruct. However, if the DNA that controls cell growth, multiplication, death or DNA damage is affected, that cell could become a cancer cell. Even so, a cell with damaged DNA may cause no trouble for many years. Normally, damage to more than one part of DNA is needed to make a cancer cell.

Types of cancer?

There are racial and geographic differences in the incidence of various types of cancer. This suggests either an inherited disposition for some tumour types or the existence of environmental factors. In the UK, the commonest cancer in men is lung cancer, followed by cancers of the prostate, bowel, stomach, oesophagus, pancreas and non-Hodgkin's lymphoma. Women most commonly suffer from breast cancer, followed by lung, bowel, ovarian, pancreas, stomach and oesophageal cancer.

Steps that can be taken to reduce the risks of cancer

1. Do not smoke. Cigarettes are full of chemicals that damage your DNA. Smoking doubles your overall chance of getting cancer. You are 25 times more likely to get lung cancer than someone who does not smoke. The only group of people among whom smoking is getting more common is teenagers and young adults. Many experts expect that lung cancer will soon kill more women in Britain each year than any other type of cancer.
2. Moderate your consumption of alcohol. Alcohol is linked to approximately 3% of cancer incidence, particularly in the mouth, larynx, oesophagus and liver.
3. Increase your daily intake of fruit, vegetables and fibre. It is estimated that dietary changes could pre-

vent about 30% of cancers, perhaps more. As yet we have no concrete proof as to which elements of diet protect against cancer, but most researchers agree that eating plenty of fruit and vegetables and cutting down on red meat and animal fats is a good idea.

4. Avoid excessive exposure to the sun. Rays from the sun can damage the DNA of your skin and eye cells.
5. Follow all the guidelines to reduce exposure to harmful chemicals. For example, hazards such as asbestos are now being removed from public places and homes.
6. See a doctor if you suffer from any unexplained changes in health that persist for longer than 2 weeks.
7. Women: undertake regular cervical smear tests and breast examinations.

The earlier a cancer is detected, the easier it is to cure. Over half of cancer sufferers are cured today, especially if the disease is found before it has spread around the body.

Caring for cancer patients

Patients receiving a diagnosis of cancer are likely to feel a range of emotional responses — such as anger, blame, guilt, resentment and disbelief. Doctors relaying the news must be trained to be extremely sensitive. In addition, an increasing number of organizations have been formed to help with specific cancers, for example, breast, colon and leukaemia. Most are run by people with first-hand experience of cancer, either as sufferers themselves or from caring for family members with the disease.

Medical care for the terminally ill is provided by hospitals, but these are not designed to provide the appropriate emotional support. An increasing number of hospices are being established, which aim to provide the expert care to allow the last part of a person's life to be lived out with dignity, humanity and comfort. The care extends to the needs of the family as well as the patient, and continues after the person's death. Around one-third of cancer patients choose to die at home, and several organizations exist (e.g. Macmillan Nurses) to provide invaluable home support during this period.

The passive smoking debate

Passive smoking is the inhalation of smoke from other peoples' tobacco. Many studies suggest that passive smoking increases the risk of lung cancer. It is estimated that 10% of lung cancer deaths in non-smokers may be attributed to passive smoking. In the UK, this translates to about 300 deaths a year. Studies show that if your husband or wife smokes, but you do not, your chances of developing lung cancer are increased by around 25–30%.

Class discussion

Any discussion must be sensitive to individual situations and teachers must be aware of any experience of cancer within their class of pupils. Almost everyone in a class will know people who have had or still have cancer. Try to establish the range of different types of cancer that they know of, and any pre-conceived ideas that are held within the class. Discuss the known causes and means of avoiding certain types of cancer. Record pupils' responses on a blackboard or flipchart.

(10 minutes)

Group work

Split the class into groups and designate each group to use pages 44–55 of the book to complete one specific topic out of the four sections outlined on the worksheet on ‘Cancer’.

(10 minutes)

Class discussion 2

The debate about passive smoking often focuses on the rights and freedoms of individuals. Ask the class to consider the following questions. What rights do smokers have? What rights do non-smokers have? Some workplaces and public places (e.g. transport systems, restaurants) ban smoking altogether or have designated areas for smokers. What are the arguments in favour of each position?

Some people have suggested that anyone suffering from smoking-related illnesses should have to pay for their own medical treatment, arguing that their illness is ‘voluntarily self-inflicted’. Ask the class whether they agree with this view. A leading tobacco company in the USA has recently admitted the direct link between smoking and lung cancer. Does the class feel that compensation should be made available by the company to their customers who have contracted lung cancer as a result of smoking?

(15 minutes)

Additional activities (as homework or a separate session)

Ask students to design a poster or other type of promotion (e.g. video, advert) on behalf of the Department of Health to highlight the risks of cancer and the measures that should be taken to minimize these risks: e.g. increased incidence of skin cancer linked to foreign holidays and sun-bed usage; relationship between colon cancer and diet.

(30 minutes)