

# **Promoting Cervical Screening Information for Health Professionals**

## **Cancer in General**

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# Contents

<b>1. What is cancer? Normal and abnormal cells.....</b>	<b>3</b>
1.1 Primary and secondary cancer.....	4
1.2 What causes cancer?.....	4
1.3 Different types of cancer.....	6
1.4 Treatment for cancer.....	6
1.5 Making Decisions about Treatment.....	8
1.6 Recovery and Follow Up.....	8
<b>2 References .....</b>	<b>9</b>
2.1 Additional Reading.....	9
3.    2.2 Additional Resources .....	9

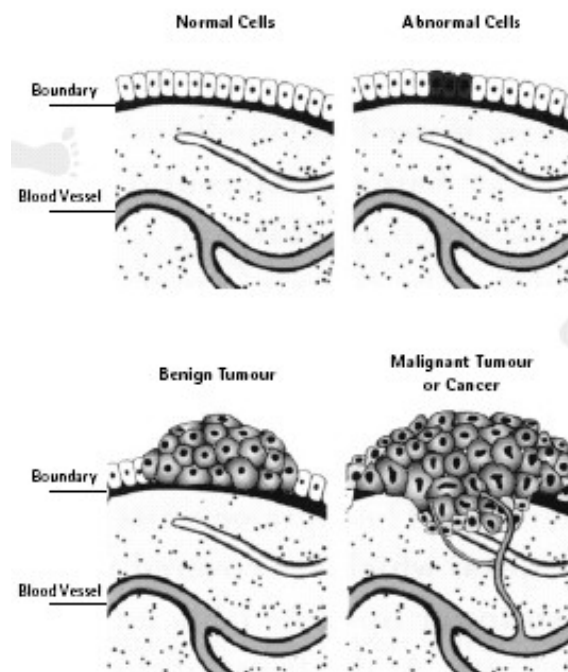
# 1. What is cancer? Normal and abnormal cells

The human body is made up of about 3 trillion cells. Cancer is a disease of these cells. At the centre of each cell is a structure called the nucleus, which is like a memory chip in a computer. The nucleus contains deoxyribonucleic acid (DNA) and about 100,000 genes which control every activity in the cell. It is in this nucleus that all the information about the structure and function of the cell is stored. Damage to DNA for example by tobacco or other harmful substances can lead to the information stored in the nucleus to be altered. Such alteration can change the way that these cells behave.

## Normal cells:

- Normal cells look different from each other because they perform different functions, for example, skin cells look different from muscle cells. The function of cells depends on their place in the body.
- All normal cells are similar when they are formed. As with any living thing, cells live for a while and then die when old or injured. Before they are replaced however they reproduce in a very precise, orderly and well controlled way. This controlled reproduction is directed by the above mentioned nucleus. When changes in the nucleus occur, the process for orderly division and controlled reproduction is disturbed. When this happens, cells start dividing in an uncontrolled way.

### Beginnings of Cancer



Some benign tumours are precancerous and may progress to cancer, if left untreated. Other benign tumours do not develop into cancer.

## **Cancer cells:**

- When cells start to divide in uncontrolled way they form a lump or a tumour. Once this happens the cells in a lump grow quickly and lose their specialised structure and function. These cells start to crowd out and destroy other cells around them. When this happens these cells are called *cancer cells*, *malignant cells* or *malignant tumours*. If malignant cells are not treated they often spread beyond their normal boundaries and into surrounding tissues. This is a multi-step process which develops over a long time.

There are over 100 different types of malignant tumours. Each of these tumours behaves differently and the treatment for each of the tumours is very different.

- Some lumps or tumours are *benign tumours*; Benign tumours do not spread outside their normal boundary to other parts of the body. If they are removed by surgery they normally do not grow back.

## **1.1 Primary and secondary cancer**

When malignant tumours or cells first develop they may stay in that original site for a while (primary cancer). If they are not treated (for example removed by surgery) the cancer cells can move via the blood stream or lymphatic system to other parts of the body eg liver, lung, and brain to form other tumours at the new site. This is called a *metastasis* or secondary cancer. Secondary cancers are often difficult to diagnose and more complex to treat.

## **1.2 What causes cancer?**

The causes of cancer are not fully understood. It is important however to stress that the development of cancer is not a sudden event. It is a chain of events over a period of time. In some cases we can identify factors which may predispose a person to develop the disease. In other cases no such factor may be recognised. One fact that is often overlooked is that cancer is not a new disease; there is evidence that suggests it was well known to Egyptians and ancient Greeks. Cancer is also found in all parts of the world and cancer also occurs in the animal species.

However there are different types of cancers found in different countries. For example, the most common cancers in Australia (apart from skin cancer) in the Caucasian population are lung cancer in men, breast cancer in women and bowel cancer in both sexes. In South African indigenous people, cancer of the liver is common while in China cancers of the nasal passages are common. In the Japanese population who live in Japan, cancer of the stomach is common while breast cancer in women living in Japan is rare (Lowenthal, 1996).

There are some causes for cancer development in the environment and some in a person's behaviour that can contribute to the development of cancer, for example:

### **Tobacco**

There are thousands of chemicals in tobacco that can lead to the development of cancer of the lung, oesophagus, throat, mouth, tongue, stomach, cervix, kidney and bladder in people who smoke.

Smoking in close proximity to others also exposes them to the risk of developing the above-mentioned cancers as they breathe in the smoke. This is called *passive smoking*.

### **Sunlight**

Extensive and constant exposure to sunlight over many years can lead to changes in the skin which predispose to development of skin cancer. Fair skin persons are particularly at high risk and often the damage discovered in later life can be attributed to the person's childhood exposure to sunlight.

### **Alcohol**

The connection between alcohol and cancer is complicated but we do know that there is a link. The clearest link between alcohol and cancer is for cancer of the head, neck, mouth, tongue, pharynx (throat), larynx (voice box) and oesophagus (food pipe).

### **Food and Foodstuffs**

Much work has been done in this area and we still have a lot to learn. Scientists have suggested that eating a plentiful supply of vegetables and fruit, less fat and more fibre (wholegrain bread, pasta and rice) can reduce the risk of some cancers.

The Cancer Council Australia recommends a diet that may be helpful in reducing the risk of some cancers. The Council suggests the following:

1. Eat a wide variety of foods
2. Control your weight; that is avoid being overweight
3. Eat more vegetables, fruit and wholegrain cereals
4. Cured foods (bacons, sausages, hams) should not be a regular or daily part of the diet
5. Be moderate with alcohol or avoid it altogether.

### **X-ray radiation**

Exposure to radiation is associated with an increased risk of developing cancer. For example, after atomic bombs were dropped on Hiroshima and Nagasaki in Japan during World War Two, leukaemia, thyroid and lung cancers were common in those who survived.

### **Industrial chemicals**

Some industrial processes have been linked to the development of cancer.

For example:

- Uranium miners have an increased risk of developing lung cancer
- Asbestos workers have a high incidence of cancer of the lung and mesothelioma
- people working with chemicals of all types should avoid inhaling them or allowing them to come into contact with the skin.

### **Viruses**

Viruses are microscopic forms of life that can cause some cancers. Hepatitis B and C viruses are associated with cancer of the liver. There is overwhelming evidence that the human papillomavirus (HPV) is necessary but not sufficient for the development of cancer of the cervix. HPV has also been linked to others cancers such as cancer of the anus, mouth and oropharynx.

Over time HPV can cause cell changes to the cervix. The changes can vary from very mild (low grade abnormalities) to more serious (high grade abnormalities). More than 95% of women who acquire a genital HPV infection clear the infection within three years and in most cases the infection clears up in about 8 to 14 months without any treatment. Just because a woman has HPV does not necessarily mean she will get cervical cancer. Researchers are still investigating why some women with HPV go on to develop cervical cancer. It is known that progression to cervical cancer in young women (under 30) is uncommon and that there is a long time period involved (greater than 7 years on average).

### **1.3 Different types of cancer**

Cancers are named by the part of the body they come from (the primary site), for example a cancer that starts in the cervix is called cervical cancer. Specific cancers are diagnosed by using variety of methods. Once the diagnosis is made, treatment is tailored to the patient's condition.

### **1.4 Treatment for cancer**

Nowhere have advances in medical science been as dramatic as in the field of cancer treatment. Some 30 or 40 years ago cancer was feared and often referred to as a death sentence. Now many cancers can be detected much earlier and cured. If some cancers cannot be cured they can be treated. The survival rate of people who live with cancer has markedly increased and those who are living with cancer often have good quality of life.

The standard methods of cancer treatment used today are *surgery, radiation therapy and chemotherapy*. Other methods include hormone treatment and bone marrow transplantation. There is much research being done in the area of gene therapy which holds much promise for cancer treatment in the future. The form of treatment chosen depends largely on the type of cancer and how advanced it is. Some forms of cancer require treatment by a combination of the methods mentioned above. It is also important to know that treatment for every cancer sufferer is designed to suit a particular individual condition and person.

Specific treatment for cervical abnormalities and cervical cancer is included in Chapter 7.

**Surgery for Cancer (Operation for cancer):**

Surgery is the oldest form of treatment for cancer. Most patients will have surgery at some time during the course of their illness. Surgery can find out if a lump that is found in the breast, for example, is cancerous or not (this is called a biopsy). Surgery can be curative. In this case the cancerous or the malignant lump is removed and this may be all the treatment that is required. If a regrowth of cancer occurs after the initial surgery, the cancer may be removed again and then other treatments are most likely to follow.

Sometimes the cancer can cause an obstruction or a blockage and needs to be removed, for example a bowel cancer could cause an obstruction to the flow in the bowel. Even if it may not be possible to remove all the cancer, an operation may bypass the blockage and restore the flow. Surgery therefore can be used to reduce symptoms from the cancer and reduce discomfort for the cancer sufferer.

For some cancers, especially those of the bowel, head, neck and breast, surgery is the main form of treatment. Surgery is also helpful in treating early lung cancer, brain tumours and cancers of the womb, ovaries and cervix.

### **Radiation Therapy**

The name "Radiation therapy" refers to the use of x-rays or gamma rays as treatment. Radiation therapy is a local treatment that can kill cancer cells in the area of the body being treated. Radiation can be directed at the tumour from the outside using a special machine called a linear accelerator, or from the inside when the radioactive source is implanted into the affected area (this is called brachytherapy). Because the rays can damage normal as well as cancerous cells, every patient has his or her treatment carefully planned to make sure that the damage done to healthy cells is minimal. Often special shields are made and placed on the patient so that the radiation therapy does not damage organs close to the treatment area.

Sometimes radiation therapy is the only type of treatment used, although it is commonly combined with surgery, chemotherapy or both.

About half of all cancer patients receive radiation therapy at some stage during their illness. Treatment is generally given for a few minutes a day, or three to five times a week for two to six weeks. Occasionally a single treatment is used. The treatment procedure itself is not painful, but there may be some side-effects after the procedure is completed.

Temporary side-effects of radiation therapy depend on the area of the body being treated. Side-effects may include changes to the skin, tiredness, loss of appetite and/or diarrhoea. If side-effects occur they can often be successfully treated with a variety of medications.

### **Chemotherapy**

Chemotherapy uses special anti-cancer medicine to kill cancer cells, which might have moved away from the primary site. It can also be used in addition to local treatment (eg surgery or radiation therapy) if there is a high probability that microscopic (very small) metastases are present. These medicines are often called cytotoxic drugs, which mean that they are poisonous or toxic to cells. This type of treatment is tailor-made to suit each person who suffers from cancer and the treatment is given either as a tablet, an injection or via intravenous fluid (an infusion or 'drip'). The time it takes to complete the treatment also varies from several weeks to a few months depending on the individual case.

Because normal cells are also affected by chemotherapy, some people experience side-effects. The side-effects of chemotherapy vary from person to person. However, as a general rule, they may include nausea, vomiting, depression and/or feeling off-colour and tired. Some people experience loss or thinning of hair on the head and body. Almost all side-effects of chemotherapy are temporary and reversible.

### **Hormone Therapy**

Hormones are chemical messengers. Some organs are under the influence of hormones released from other parts of the body. For example, an area in the brain called the hypothalamus can stimulate the pituitary gland beneath the brain to release hormones which act in turn on the ovary or testicles to produce female hormones- oestrogens or the male hormones-androgens. Organs sensitive to these sex hormones include breast tissue, the lining of the uterus (endometrium), the ovaries and the prostate gland.

Hormone treatment is designed to interfere with the normal hormone-stimulated growth of the cancer and results in the cancer being destroyed.

### **Gene Therapy**

A lot of research is being done in this area because the potential of this new technology is large. It involves inserting a correctly functioning gene into a cell. This gene could produce a substance that could cause the cancer to die or replace some of the ability that the cell has lost when it reproduces.

## **1.5 Making Decisions about Treatment**

There are many treatment options available. When faced with a decision about treatment, the decision can be difficult. Often after diagnosis, things are happening so fast that it may be hard for a person to take it all in or think it all through. Sometimes a person is given a lot of information, which they do not understand. That information may include medical words or clinical jargon. This can make a person frightened and anxious about the future. If the person feels this way they may need to make another appointment to see the doctor again so that they can ask for more information. They can also talk it over with their family, their local Health Worker, nursing staff, the hospital social worker or others that they feel comfortable with.

Some people often ask to be sent to another doctor to get a second opinion. This can help with making a decision about treatment. The person can ask for written information about their diagnosis, prognosis and condition or treatment at any time and should be encouraged to ask as many questions as required until they understand the information provided. A support person, for example a family member or friend or your local health worker can assist with this at medical appointments.

## **1.6 Recovery and Follow Up**

After treatment is completed, a person usually needs to have regular checkups just to make sure that everything is going all right and there are no problems. These checkups will gradually become less frequent.

If cancer returns it can often be treated successfully. However, it is important to remember that treatment used for cancer that has returned, is often different from the first treatment used.

## 2 References

Lowenthal, R. 1996, *Cancer. What to do about it*, Lothian Books.

### 2.1 Additional Reading

Australian Institute of Health and Welfare 2007, *Cancer in Australia: An overview*, *Cancer series* Number 37, Australian Institute of Health and Welfare, Canberra.

Oliver, I. 1998, *Conquering Cancer – Your guide to treatment and research*, Allen & Urwin.

Kune, G. 1999, *Reducing the odds – A manual for prevention of cancer*, Allen & Urwin.

Cancer Council Australia. *National Cancer Prevention Policy 2004-2006*, [Online] Available at: <http://www.cancer.org.au>.

National Health Medical Research Council. 2003, *Clinical Practice Guidelines for the Psychological Care of Adults with Cancer*, National Breast Cancer Centre.

### 2.2 Additional Resources

#### Understanding Radiotherapy

The Queensland Cancer Fund has a booklet and a video titled “Understanding Radiation Therapy” available free of charge that provides more detailed information about radiation therapy. This booklet and the video can be sent out on request by contacting the telephone **Helpline on 13 11 20**.

#### Understanding Chemotherapy

The Queensland Cancer Fund has a booklet and a video titled “Understanding Chemotherapy” available free of charge that provides more detailed information about chemotherapy. This booklet and the video can be sent out on request by contacting the telephone **Helpline on 13 11 20**.

#### Hair Loss

The Queensland Cancer Fund has a booklet about hair loss during treatment. The booklets give hints on how to cope with that. The booklet is free and can be obtained from the Queensland cancer Fund by ringing the **Helpline on 13 11 20**