

## Leukaemia

Leukaemia is a cancer of the blood-forming cells, which are made in the bone marrow. Leukaemia causes large numbers of white blood cells to be produced. This can crowd the bone marrow and may affect the production of normal cells. A person with leukaemia may be more likely to pick up infections and have trouble getting rid of them. Over 660 Victorians develop leukaemia every year.

There are four main types of leukaemia. In many cases, leukaemia can be cured or kept under control for many years. Chemotherapy is the main treatment.

### Large numbers of abnormal white cells

Blood is mostly made up of plasma, which is a clear fluid. Floating in this fluid are three types of cells:

- **Red blood cells** – that carry oxygen around the body
- **White blood cells** – that fight disease and infection
- **Platelets** – that help to stop bleeding when it starts.

Blood cells are made in the bone marrow, which is the spongy part in the centre of the bone.

When the body is healthy, the numbers of red cells, white cells and platelets in the blood are kept in balance. In people with leukaemia, the bone marrow makes too many abnormal white blood cells. These abnormal cells are unable to carry out their normal function and can crowd the bone marrow. This means that there is not enough room in the bone marrow for making normal white blood cells, red blood cells and platelets.

White blood cells normally help to fight infection. In a person with leukaemia, a large number of these cells are abnormal. If a person has too many abnormal white blood cells, they are more likely to pick up infections and have trouble getting rid of them.

### Risks and causes

The cause of most cases of leukaemia is unknown. There are several risk factors that may increase your chance of developing this disease. The main ones are:

- Exposure to intense levels of radiation – no cases of leukaemia have been linked to radiation from x-rays and CT scans
- Exposure to a chemical called benzene at work over long periods of time
- Cigarette smoking – this can increase your risk of some types of leukaemia
- Genetic factors – certain inherited conditions can increase your risk of developing some types of leukaemia
- Family history, age and gender – these can all have an effect on your risk of developing certain types of leukaemia.

Research into further possible causes is ongoing.

### Different types

There are different types of leukaemia and the treatment for each is different. The condition may:

- Develop suddenly (over days or weeks) – this is called acute leukaemia.
- Develop over months or years – this is called chronic leukaemia.
- Involve either the myeloid or lymphoid cells – the condition is named for the type of blood cell affected.

### Most common types of leukaemia

There are four main types of leukaemia.

### **Acute lymphocytic leukaemia (ALL)**

ALL affects lymphocytes (a type of white blood cell, whose main function is to protect the body from infection) so they cannot work properly. This may cause a serious infection. It also causes many abnormal lymphocytes to be made, which crowd out the normal red blood cells and platelets. ALL is the most common type in children. It is rare in adults.

### **Chronic lymphocytic leukaemia (CLL)**

CLL also affects the lymphocytes but develops more slowly than ALL. Most people with CLL are not even aware that they have the disease and may only be diagnosed during an examination for another medical problem. CLL affects adults and does not occur in children.

### **Acute myeloid leukaemia (AML)**

AML mainly affects the myeloid cells known as granulocytes. These cells search for infectious invaders in the blood and nearby tissue. In AML, too many young myeloid cells are produced and there are not enough mature myeloid cells. The young myeloid cells can block blood vessels. AML mainly affects adults, but can occur in children and adolescents.

### **Chronic myeloid leukaemia (CML)**

Too many mature myeloid cells are present in CML and they do not function properly. CML is also different from the more common types of leukaemia because it has two stages:

- Abnormal cells slowly multiply
- Quickly changing, it becomes exactly like AML.

This leukaemia can occur at any age, but is uncommon below the age of 20 years.

### **Symptoms**

The symptoms of leukaemia may vary slightly depending on the type and stage of leukaemia you have. Symptoms for acute leukaemia usually happen quite suddenly. They include:

- Weakness, tiredness and looking 'washed out'
- Regular infections and high temperatures
- Bleeding easily
- Bleeding from the gums and nose
- Bruising easily with no obvious cause
- Pain in the bones and joints
- Weight loss
- Swollen lymph glands
- Abdominal discomfort due to an enlarged spleen.

People with chronic leukaemia will also have many of these symptoms but they tend to develop over months or years.

Most people who have any of these symptoms will not have leukaemia. They are more likely to be suffering from a much less serious problem, such as an infection. However, it is always important to see your doctor if you have symptoms.

### **Diagnosis**

Tests to help diagnose leukaemia may include:

- **Blood tests** – to check for large numbers of abnormal white blood cells.
- **Bone marrow biopsy** – a small amount of fluid is taken from the bone marrow using a needle. The samples are then examined under a microscope. This test can help work out which type of leukaemia is present.
- **Lymph node biopsy** – a small amount of tissue is removed with a needle from a swollen lymph node. It is examined under a microscope.
- **Lumbar puncture** – fluid is removed with a needle from a space between the bones in the back. The fluid is looked at under a microscope.

If these tests show that you do have leukaemia, you may also need to have further blood and bone marrow tests as well as some scans (CT, ultrasound or MRI).

Test results can take a few days to come back. It is very natural to feel anxious while waiting to get your results. It can help to talk to a close friend or relative about how you are feeling. You could also contact your local cancer information and support service.

### Treatment

Most children and many adults with acute leukaemia can expect to be cured. For most people, chronic leukaemia can be successfully managed for long periods of time.

Treatment depends on the type of leukaemia, but may include:

- **Chemotherapy** – with cancer-killing drugs. These are usually given intravenously, but may sometimes be given as tablets. For some people, chemotherapy for acute leukaemia will mean spending several weeks in hospital. Others may be able to stay at home but will need regular hospital check-ups and further treatments.
- **Intensive treatment such as a stem cell transplant** – a transplant allows you to have much higher doses of chemotherapy than usual, which may help to improve the chances of curing some types of leukaemia or lymphoma or of prolonging remission. Very high doses of chemotherapy, sometimes with total body irradiation (TBI), are usually given over a few days. The high-dose treatment destroys the bone marrow and stem cells (stem cells are immature cells from which blood cells evolve, which grow in the bone marrow). After the high-dose treatment, you will be given a drip (infusion) of either your own stem cells (autologous transplant) or stem cells from a donor (allogeneic transplant).
- **Biological therapy** – also known as immunotherapy. This is the use of substances that are naturally produced within the body to encourage the immune system to fight disease. Interferon and growth factors are used to treat leukaemia.
- **Radiotherapy** – may be used for different types of leukaemia to help control symptoms, as part of intensive treatment regimes or to treat cancer that has spread to the brain or spinal cord.
- **Steroids** – research has shown that treatment for some types of leukaemia is better if steroids are given alongside the chemotherapy.
- **All-trans-retinoic acid** – this is a form of vitamin A used to treat a type of acute myeloid leukaemia. It is usually taken as tablets with chemotherapy.

### Treatment side effects

All treatments have side effects. These will vary depending on the type of treatment you are having. Many side effects are temporary but some may be permanent. Your doctor will explain all the possible side effects before your treatment begins.

### Where to get help

- Your doctor
- Cancer Council Victoria, Information and Support Service Tel. 13 11 20  
[www.cancervic.org.au](http://www.cancervic.org.au)
- Multilingual Cancer Information Line, Victoria – see the CCV website for contact details  
[www.cancervic.org.au/other\\_languages/multilingual\\_cancer\\_information\\_line](http://www.cancervic.org.au/other_languages/multilingual_cancer_information_line)
- Leukaemia Foundation of Victoria Tel. 1800 620 420 or (03) 9949 5800
- Leukaemia Family Support Group Tel. (03) 9342 7888

### Things to remember

- Leukaemia is a cancer of blood-forming cells, which causes large numbers of white blood cells to be made.
- A lot of leukaemia can be cured or kept under control for many years.
- There are four main types of leukaemia.
- The main treatment is with chemotherapy.

**This page has been produced in consultation with, and approved by:**

Cancer Council Victoria

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