



Hodgkin disease is a type of cancer called a lymphoma. It occurs when certain types of white blood cells called lymphocytes grow in an uncontrolled way. Lymphocytes are part of the immune system that help our bodies fight infection.

Hodgkin disease can start anywhere in the lymphatic system, which is the network of vessels, tissues and organs that make white blood cells, and move lymph around the body. It commonly starts in the lymph nodes in the upper body, such as in the chest, neck or underarms. It can spread to other lymph nodes and throughout the lymphatic system.

There are two main types of Hodgkin disease:

- classic Hodgkin disease
- nodular lymphocyte predominant Hodgkin disease.

Hodgkin disease is more common in older children and teenagers than in young children.

A different type of lymphoma that occurs in children is called [non-Hodgkin lymphoma](#).

## Risk factors

A risk factor is anything that increases a person's chance of developing a certain condition or disease, such as cancer. In adults, lifestyle and environmental factors (such as smoking or exposure to certain chemicals) can be significant risk factors for developing certain types of cancer. In children, very few risk factors have been identified that increase the chance of developing cancer. For most children with cancer, the underlying cause is unknown.

Even if your child has a risk factor, it does not mean they will develop cancer. Many children with a risk factor will never develop cancer, while others with cancer may have had no known risk factors. Even if a child with a risk factor develops cancer, it is usually hard to know how much that risk factor contributed to the development of their disease.

The causes of Hodgkin disease are not well understood, but factors associated with a higher chance of developing Hodgkin disease include the following:

### Family history

Children who have a brother or sister – especially a twin – with Hodgkin disease have a higher chance of developing Hodgkin disease themselves.

### Certain virus infections

People who have been infected with Epstein–Barr virus (also called glandular fever, infectious



mononucleosis or 'mono') have a higher chance of developing Hodgkin disease, although this risk is very small.

People who are HIV-positive also have a higher chance of developing Hodgkin disease.

## Symptoms

Symptoms of Hodgkin disease may include:

- fever
- night sweats
- unexplained weight loss
- enlarged lymph nodes, usually felt as painless lumps under the skin in the neck, underarm or groin
- itchy skin
- tiredness
- loss of appetite
- coughing or trouble breathing (swollen lymph nodes in the chest can press on the windpipe).

### Note about symptoms

Many conditions – including common childhood infections – can cause these symptoms, not just Hodgkin disease. If your child has any of these symptoms and you are concerned, talk to your child's doctor.

## Diagnosis

Your child will have a number of tests to investigate their symptoms and confirm a diagnosis of Hodgkin disease, including:

- medical history and physical examination
- blood tests
- medical imaging, which may include
  - chest X-ray



- computed tomography (CT) scan
- magnetic resonance imaging (MRI)
- positron emission tomography (PET) scan
- lymph node biopsy – where a small sample of a lymph node is removed to be examined under a microscope
- bone marrow aspiration and biopsy – where a sample of bone marrow and a small piece of bone are taken to be examined under a microscope.

These tests are explained in more detail in [How is cancer diagnosed?](#)

## Staging

If your child is diagnosed with Hodgkin disease, some of the diagnostic tests will also help to stage the tumour. Staging determines where the tumour is, how big it is, which nearby organs are involved and whether it has spread to other parts of the body. This is important to determine the outlook (prognosis) for your child, and to decide on the best options for treatment.

There are different ways to assess the stage or extent of disease. One of the most common ways of describing stages for Hodgkin disease is as follows:

- **Stage I** – the cancer is found only in 1 lymph node area or lymphoid organ (such as the thymus), or only in 1 organ outside the lymphatic system.
- **Stage II** – the cancer is found in 2 or more lymph node areas on the same side of the body (either both above or both below the diaphragm, which separates the chest and the abdomen), or the cancer has spread from 1 lymph node area into 1 nearby organ.
- **Stage III** – either the cancer is found in more than 1 lymph node area on both sides of the diaphragm (both above and below), or it is found in lymph node areas both above and below the diaphragm and has spread to a nearby organ and/or the spleen.
- **Stage IV** – the cancer has spread to 1 or more organs outside the lymphatic system; or it is found in 2 organs in distant parts of the body (but not in the nearby lymph nodes); or it is in the liver, bone marrow, lungs or cerebrospinal fluid.

## Treatment

Treatment and care of children with cancer is usually provided by a team of health professionals called a multidisciplinary team. Members of this team are specialists in children's cancers – they understand the differences between children's cancer and adult cancer, and each team member brings different skills in managing care to meet the needs of both you and your child.

The team will be led by a childhood cancer specialist (paediatric oncologist). Other members of the





team depend on the age of your child and their type of disease, and may change over time as your child's needs change. A list of team members who might make up the multidisciplinary team can be found in [The treatment team](#).

Treatment for Hodgkin disease depends on the age of your child, the stage of the disease, the biological features of the cancer and other factors identified during diagnosis. Treatment will be tailored to your child's particular situation, and may involve one or more of the following (see [How is cancer treated](#) for more detail).

## Surgery

Surgery is rarely used to treat Hodgkin disease, but can sometimes be used to remove tumours in certain types of Hodgkin disease. Usually, no further therapy is needed after surgery, and the child will be under careful observation.

## Chemotherapy

Chemotherapy uses anti-cancer medicines to destroy cancer cells. It is often given as a combination of medicines to try to prevent the cancer cells from becoming resistant to just one or two medicines.

Chemotherapy medicines are given together in courses, often over a few days. Once the body has recovered from the side effects, the next course is given. Most children receive multiple courses of chemotherapy.

Hodgkin disease is usually treated with combination chemotherapy.

## Radiation therapy

Radiation therapy (also called radiotherapy) uses high-energy X-rays or other types of radiation to destroy cancer cells or stop them from growing. A type of radiation therapy called external beam radiation may be used if Hodgkin disease is only in one part of the body. It can be used in combination with chemotherapy.

Radiation therapy can have long-term side effects in children. If radiation therapy is included in your child's treatment, special care will be taken to reduce these risks.

## Targeted therapy

Some medicines can target the specific changes in cancer cells that make them different from normal cells. This means that they work differently from standard chemotherapy, and they usually have fewer side effects, or the side effects are not as severe.

Drugs called rituximab and brentuximab vedotin are monoclonal antibodies that may be used to treat





Hodgkin disease. These drugs find the abnormal cells and attach to them. They can deliver chemotherapy that either directly destroys the cells or stops the cells from dividing.

Targeted therapies are usually given in combination with other types of treatment.

## Stem cell transplant

Some children may be treated using a stem cell transplant (also known as a bone marrow transplant), in combination with high-dose chemotherapy or radiation therapy. However, this is usually only done for children whose Hodgkin disease has come back (relapsed) after initial treatment with chemotherapy and/or radiation therapy.

## Support

Diagnosis of cancer in a child is a very difficult time for the child, their family and their friends. You might feel overwhelmed, scared, anxious or angry. These are all normal feelings. It is very important to seek support from family, friends, health professionals or other services to help you, your child and your family cope with cancer.

Talk to your child's treatment team if you are having difficulties coping.

[Living with children's cancer](#) has information about physical, emotional and practical issues during and after diagnosis and treatment. There is also a page with helpful links on [where to find support](#).

The [Cancer Council](#) in your state or territory can give you general information about cancer, as well as information on resources and support groups in your local area. Call the Cancer Council Helpline from anywhere in Australia for the cost of a local call on **13 11 20**.

For additional specific information about childhood cancer, contact any of the major [children's hospitals and networks](#) in your state or territory.

## Chance of cure

Many children with cancer are cured of the disease. Children's bodies have great capacity for healing. Also, huge improvements have been made in the treatment of childhood cancer in the past few





decades. In the 1980s, around 65% of children diagnosed with cancer were alive more than 5 years after their diagnosis. Today, around 83% of children are successfully treated and become long-term survivors.

Long-term survival (also called the outlook or prognosis) and treatment options depend on a range of factors, including:

- age of your child at diagnosis
- extent or stage of the cancer
- appearance of the cancer cells under the microscope (the shape, function and structure of the cells)
- how the cancer responds to treatment
- cancer or tumour biology, which includes
  - the patterns of the cancer cells
  - how different the cancer cells are from normal cells
  - how fast the cancer cells are growing.

Talk to your child's doctor about your child's individual disease, treatment options and outlook.

## Clinical trials

Researchers are trialling new ways to diagnose and treat different types of cancer. Your child may be invited to be part of a clinical trial to test new ways of treating Hodgkin disease.

New treatments have to go through very strict regulation and approval processes before they can be used in a clinical trial. Your child's doctor will explain everything about the trial and give you detailed written information. You will need to give special permission for your child to be part of the trial.

Participating in a clinical trial may or may not directly benefit your child, but the results of clinical trials today will help children with cancer in the future.

See [Clinical trials and research](#) for more information, including whether there are any clinical trials your child can join.

## More information

For more information about Hodgkin disease, see:



- [Hodgkin disease](#), from the American Cancer Society
- [Childhood Hodgkin lymphoma treatment \(PDQ®\)](#), from the National Cancer Institute (United States).

