CONDITION

Hodgkin lymphoma in children

Hodgkin lymphoma is a cancer of the lymphatic system that usually responds well to treatment in children.

WHAT IT IS
Cancer affecting lymphocytes in the lymphatic system

BODY SYSTEM
Immune and lymphatic systems

MAIN SYMPTOMS
Painless swollen nodes, fever, night sweats, weight loss

WHAT CAUSES IT
Usually unknown; sometimes linked with Epstein-Barr virus

HOW IT IS DIAGNOSED
Lymph node biopsy, supported by blood tests and imaging

MAIN TREATMENT
Combination chemotherapy, sometimes radiation or targeted medicines

CAN IT BE CURED?
Yes - most children are cured with treatment

IS IT AN EMERGENCY?
Sometimes - breathing difficulty requires emergency care

LONG-TERM OUTLOOK
Usually excellent, with lifelong monitoring for late effects

Overview

Hodgkin lymphoma is a cancer that begins in lymphocytes, a type of white blood cell. Lymphocytes are part of the immune system, which helps protect the body from infection.

These cells travel through the lymphatic system. This is a network of lymph nodes, vessels and organs such as the spleen. Lymph nodes are small, bean-shaped structures found throughout the body, including the neck, chest, armpits and groin.

In Hodgkin lymphoma, abnormal lymphocytes multiply and may collect in lymph nodes or other tissues. The condition often first appears as a painless swollen lymph node, especially in the neck or above the collarbone.

Hodgkin lymphoma affects children and teenagers, although it is less common in younger

children. It is highly treatable. Most children are cured, but treatment needs to balance removing the lymphoma with reducing possible long-term effects.

There are different forms of Hodgkin lymphoma. Most children have classical Hodgkin lymphoma. A less common form, previously called nodular lymphocyte-predominant Hodgkin lymphoma, is now often called nodular lymphocyte-predominant B-cell lymphoma. The exact type can affect treatment decisions.

Symptoms

The most common sign is one or more enlarged lymph nodes. They may feel rubbery or firm and are usually not painful. A swollen node does not automatically mean lymphoma. Infections are a much more common cause of enlarged lymph nodes in children.

Possible symptoms include:

Fever, drenching night sweats and significant unplanned weight loss are known as B symptoms . Doctors use this term because these symptoms help describe the stage and activity of the lymphoma.

Lymph nodes inside the chest can become enlarged without causing a visible lump. They may press on the airways and cause coughing, wheezing or difficulty breathing. Sometimes this enlargement is first seen on a chest X-ray or another scan.

- A painless lump in the neck, above the collarbone, in an armpit or in the groin
- Fever without a clear infection
- Heavy night sweats that soak clothing or bedding
- Unplanned weight loss
- Ongoing tiredness
- Itchy skin
- Reduced appetite
- Cough, chest discomfort or shortness of breath
- Abdominal swelling or discomfort

Causes and risk factors

The exact cause of Hodgkin lymphoma is usually not known. It develops when changes in a

lymphocyte allow the cell to grow and survive when it normally would not. These cell changes are generally acquired during life rather than passed directly from a parent.

Epstein-Barr virus, the virus that can cause glandular fever, is linked with some cases. Most people who have this common infection never develop Hodgkin lymphoma, so infection alone does not explain the condition.

Risk may be higher in children who have a weakened immune system. This can happen with certain inherited immune conditions, HIV infection or medicines that suppress the immune system after an organ transplant.

Having a close relative with Hodgkin lymphoma may slightly increase risk, but most affected children do not have a family history. The condition is not usually considered directly inherited.

Nothing a child or parent did caused the lymphoma. It is not linked to an injury, diet or everyday contact with someone who has cancer.

Diagnosis

A clinician may first examine the swollen lymph nodes and ask about fever, night sweats, weight loss and other symptoms. Blood tests and imaging can help investigate the cause, but they cannot confirm Hodgkin lymphoma by themselves.

Confirmation requires a biopsy , which means removing tissue for examination under a microscope. Whenever possible, a surgeon removes an entire enlarged lymph node. This gives the pathologist enough tissue to identify the type of abnormal cells and distinguish lymphoma from infection or another condition.

Classical Hodgkin lymphoma usually contains distinctive abnormal cells called Reed-Sternberg cells. These cells are tested for proteins that help confirm the diagnosis.

After confirmation, further tests show where the lymphoma is located and how active it is. These may include:

The lymphoma is assigned a stage, usually from 1 to 4. The stage describes how many areas are involved and whether lymphoma is present on one or both sides of the diaphragm, the muscle below the lungs. A higher stage does not mean treatment cannot work.

The care team also considers B symptoms, bulky areas of lymphoma and how quickly the lymphoma responds to initial treatment. These details help place the child in a treatment group.

- Blood tests to check blood cells, liver and kidney function, and inflammation

- PET-CT, which combines detailed images with a scan of active cells
- CT or MRI in selected situations
- Heart and lung tests before treatments that may affect these organs

Treatment and management

Treatment is planned by a children's cancer team. The plan is based on the lymphoma type, stage, symptoms, size of affected areas and response to the first treatment cycles.

Most children receive a combination of chemotherapy medicines. Chemotherapy travels through the bloodstream and treats lymphoma cells throughout the body. It is given in cycles, with treatment days followed by recovery periods.

A PET-CT during treatment may show how well the lymphoma is responding. This is called response-adapted treatment. A strong early response may allow some children to avoid radiation or receive less intensive treatment. Other children may need additional therapy.

Radiation therapy uses focused high-energy beams to destroy lymphoma cells in a defined area. It may be recommended when lymphoma remains active after chemotherapy or when certain areas need stronger local treatment. Modern techniques aim to limit radiation reaching nearby healthy organs.

Short-term treatment effects can include nausea, mouth soreness, tiredness, hair loss and low blood cell counts. Low white blood cell levels can increase the risk of infection. The team may provide medicines and practical support to control these effects.

If Hodgkin lymphoma returns or does not respond as expected, treatment options may include different chemotherapy, targeted medicines or immunotherapy. Targeted medicines act on particular features of lymphoma cells. Immunotherapy helps the immune system recognise and attack them.

Some children with lymphoma that has returned receive high-dose chemotherapy followed by an autologous stem cell transplant. This returns the child's previously collected blood-forming stem cells after intensive treatment.

Before treatment begins, the team may discuss whether it could affect future fertility. When appropriate and practical, fertility-preservation options may be offered.

Complications

Hodgkin lymphoma in the chest can sometimes press on the airways or major blood vessels.

This may cause breathing difficulty, swelling of the face or neck, dizziness, or prominent veins on the upper chest.

Treatment can temporarily reduce blood cell production. Possible effects include infection from low white blood cells, bruising from low platelets and tiredness from anaemia, which means having too few red blood cells.

Some health effects can appear months or years after treatment. These are called late effects. The individual risk is influenced by the medicines used, radiation area, treatment intensity and the child's age.

Possible late effects include:

These effects are possible, not inevitable. Modern treatment aims to reduce exposure while maintaining a high chance of cure. A personalised follow-up plan helps identify concerns early.

- Thyroid, heart or lung problems
- Changes in growth, bone health or puberty
- Reduced fertility
- Learning, attention or emotional difficulties
- A small increased risk of another cancer later in life

Prevention

There is no established way to prevent Hodgkin lymphoma. Its usual cause is unknown, and most risk factors cannot be changed.

Hodgkin lymphoma is not contagious. A child cannot catch it from another person, and someone with the condition does not need to be separated from family, friends or classmates because of the lymphoma itself.

Avoiding ordinary contact with Epstein-Barr virus is not a practical or proven prevention method. Children with known immune conditions may already receive regular medical monitoring, but screening is not routinely used for otherwise healthy children without symptoms.

Living with it and what to expect

Treatment commonly lasts several months, although the schedule differs by treatment group. During this time, daily life may be organised around treatment visits, blood tests, scans and

recovery periods.

Some children can attend school for part of treatment. Others need time away because of tiredness, low blood counts or infection risk. The cancer team and school can help plan learning at home, adjusted attendance and a gradual return.

Activity is often encouraged when the child feels able, but energy may change from day to day. Food preferences can also change during chemotherapy. A specialist dietitian can help if nausea, mouth soreness, weight loss or poor appetite makes eating difficult.

After treatment, follow-up visits check recovery and look for signs that the lymphoma has returned. The chance of recurrence is generally highest in the first few years. Follow-up later becomes focused more on growth, development, organ health and possible late effects.

Survivors should receive a written treatment summary and a long-term follow-up plan based on their specific treatment exposures. Follow-up may continue into adulthood because some effects, such as thyroid or heart problems, may appear many years later.

Most children return to school, activities and ordinary family life after treatment. Recovery may take time, and worry before scans or appointments is common. Emotional support can be useful for the child, siblings and caregivers.

When to get medical help

Arrange a routine medical assessment for a lump that is getting larger, lasts for several weeks or has no clear link to a recent infection. Also seek assessment for unexplained fever, drenching night sweats, weight loss or ongoing tiredness.

These symptoms have many possible causes and do not by themselves mean a child has lymphoma.

During treatment, contact the child's cancer team urgently for:

Do not wait for a routine appointment if the treatment team has advised immediate contact for fever. Infection can become serious quickly when white blood cell levels are low.

Call emergency services for severe trouble breathing, blue or grey lips, collapse, a seizure, severe confusion, or rapidly increasing swelling of the face or neck.

- A fever at or above the threshold provided by the treatment team
- Shaking chills or signs of infection
- New bruising or bleeding
- Repeated vomiting or inability to drink

- Much less urine than usual
- New or worsening pain
- Unusual sleepiness or confusion

Common questions

Is Hodgkin lymphoma in children curable?

Yes. Most children are cured with current treatment. The chance of cure is influenced by the lymphoma's stage, its features and how it responds to initial treatment. Children whose lymphoma returns may also be cured with further therapy.

Does every swollen lymph node mean lymphoma?

No. Swollen lymph nodes are common in children and are usually caused by infections. A node that keeps growing, remains enlarged for several weeks, feels unusually firm or occurs with unexplained fever, night sweats or weight loss should be assessed.

Can my child go to school during treatment?

Many children attend when they feel well and their care team considers it safe. Attendance may need to change during chemotherapy or periods of low blood counts. The school may need guidance about infection exposure, missed work and physical activity.

Is Hodgkin lymphoma inherited?

Usually not. Family history can slightly affect risk, but most children with Hodgkin lymphoma have no affected relative. Genetic testing is not routinely needed unless there are other signs of an inherited immune or cancer-risk condition.

Can Hodgkin lymphoma come back?

It can return, most often within the first few years after treatment, but many children never have a recurrence. New symptoms do not necessarily mean the lymphoma is back. Follow-up visits and appropriate tests are used to assess concerns.

Why is long-term follow-up needed after a cure?

Some treatment effects may not appear until years later. Follow-up can monitor growth, puberty, fertility, thyroid function, heart and lung health, and the small risk of another cancer. The recommended checks are based on the treatment received.

Sources

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