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## [Lymphoma - Hodgkin - Childhood - Treatment Options](#) [1]

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**ON THIS PAGE:** You will learn about the different ways doctors use to treat children with this type of cancer. To see other pages, use the menu on the side of your screen.

In general, cancer in children is uncommon, so it can be hard for doctors to plan treatments unless they know what has been most effective in other children. That is why more than 60% of children with cancer are treated as part of a clinical trial. [Clinical trials](#) [3] are research studies that compare the standard treatments, which are the best known treatments available, with newer approaches to treatments that may be more effective. Clinical trials may test new approaches such as a new drug, a new combination of standard treatments, or new doses of current therapies. Studying new treatments involves careful monitoring using scientific methods, and all participants are followed closely to track their health and progress.

To take advantage of these newer treatments, children with cancer should be treated at a specialized cancer center. Doctors at these centers have extensive experience in treating children with cancer and have access to the latest research. A doctor who specializes in treating children with cancer is called a pediatric oncologist. If a pediatric cancer center is not nearby, general cancer centers sometimes have pediatric specialists who are able to be part of your child's care.

In many cases, a team of doctors works with a child and the family to provide care; this is called a [multidisciplinary team](#) [4]. Pediatric cancer centers often have extra support services for children and their families, such as child life specialists, dietitians, physical and occupational therapists, social workers, and counselors. Special activities and programs to help your child and family cope may also be available. An increasing number of pediatric cancer centers also have

services for [teenagers](#) [5] and [young adults](#) [6]. Sometimes, adult cancer centers also offer special services and clinical trials for teens and young adults with cancer.

## Treatment overview

Treatment of Hodgkin lymphoma consists of chemotherapy and/or radiation therapy. Surgery is not commonly used as a treatment, although it may sometimes be used for localized nodular lymphocyte predominant Hodgkin lymphoma when the doctor believes the involved lymph nodes can be completely removed by surgery.

Treatment options and recommendations depend on several factors, including the type and stage of cancer, its risk grouping, possible side effects, and the patient's preferences and overall health. The amount and type of treatment used to treat Hodgkin lymphoma also depends on how many lymph node areas are involved and how large the lymph nodes have grown. Children with more high-risk or bulky disease may have more cycles of chemotherapy and radiation therapy than children with low-risk disease. Ongoing studies of childhood Hodgkin lymphoma are trying to further reduce the amount of treatment to avoid long-term side effects. Some treatments can affect the patient's ability to have a child in the future. It is important to talk with your child's doctor about ways to preserve fertility before treatment begins.

Descriptions of the most common treatment options for childhood Hodgkin lymphoma are listed below. Your child's care plan may also include treatment for symptoms and side effects, an important part of cancer care. Take time to learn about all of your child's treatment options and be sure to ask questions about things that are unclear. Also, talk about the goals of each treatment with your child's doctor and what your child can expect while receiving the treatment. Learn more about [making treatment decisions](#) [7].

## Chemotherapy

Chemotherapy is the use of drugs to destroy cancer cells, usually by stopping the cancer cells' ability to grow and divide. Chemotherapy for childhood Hodgkin lymphoma is given by a pediatric oncologist.

For Hodgkin lymphoma, chemotherapy gets into the bloodstream to reach cancer cells throughout the body. Common ways to give chemotherapy include an intravenous (IV) tube placed into a vein using a needle or in a pill or capsule that is swallowed.

A chemotherapy regimen (schedule) usually consists of a specific number of cycles given over a set period of time. A patient may receive one drug at a time or combinations of different drugs at the same time.

In the past, treatments for Hodgkin lymphoma were one of two combinations of chemotherapy, one called MOPP and another called ABVD. MOPP includes the drugs mechlorethamine (Mustargen), prednisone (multiple brand names), procarbazine (Matulane), and vincristine (Vincasar). ABVD includes the drugs bleomycin (Blenoxane), dacarbazine (DTIC-Dome),

doxorubicin (Adriamycin), and vinblastine (Velban). Many of the same drugs included in the original MOPP and ABVD regimens are used in current treatment plans and combinations for children and adolescents with Hodgkin lymphoma.

Newer treatment combinations for children may replace mechlorethamine with cyclophosphamide (Neosar) and often replace procarbazine with etoposide (Toposar, VePesid) or dacarbazine (DTIC-Dome) to reduce the risk of infertility, which is the inability to conceive a child. More recently, treatment plans for high-risk Hodgkin lymphoma use more intensive combinations of drugs, called dose-dense, over shorter periods of time. These are therapies with combinations of drugs called ABVE-PC, Stanford V, and BEACOPP.

Doctors may recommend treatment with chemotherapy alone or a combination of chemotherapy and radiation therapy for a child with Hodgkin lymphoma. See below for more information. For later-stage disease, current clinical trials often include radiation therapy. For earlier-stage lymphoma, many research studies do not include radiation therapy for children whose disease is treated successfully with chemotherapy. Current chemotherapy regimens evaluate the lymphoma's response to treatment early in the treatment schedule. A child with lymphoma that responds more quickly to treatment may need less treatment than children with lymphoma that responds to treatment more slowly.

For children with bulky or advanced disease, many doctors feel that combination treatment gives the best chance for cure because there are two ways to attack the cancer cells. In combination treatment, doctors reduce the total amount of chemotherapy and radiation therapy, which should reduce long-term side effects. The most important consideration is to use enough treatment to cure the disease with the first treatment plan. This is because the intensity of therapy is high if the disease comes back.

In addition, ongoing clinical trials for children with high-risk Hodgkin lymphoma are testing the combination of chemotherapy and targeted therapy called brentuximab vedotin. Targeted therapy is a treatment that targets the cancer's specific genes, proteins, or the tissue environment that contributes to cancer growth and survival. This type of treatment blocks the growth and spread of cancer cells while limiting damage to healthy cells. This special drug combines a type of antibody (a manufactured version of an immune system protein) that finds and attaches to the surface of most lymphoma cells with an anti-cancer drug that stops cancer cells from dividing. Researchers hope that this approach will prove effective and cause less side effects for patients.

Because chemotherapy attacks rapidly dividing cells, including those in normal tissues such as the hair, lining of the mouth, intestines, and bone marrow, children receiving chemotherapy may lose their hair, develop mouth sores, or have nausea and vomiting. In addition, chemotherapy may lower the body's resistance to infection, lead to increased bruising and bleeding, and cause fatigue. These side effects usually can be controlled during treatment and go away after chemotherapy is completed. The severity of the side effects depends on the type and amount of the drug being given and the length of time the child receives the drug. Learn more about long-

term side effects of chemotherapy in the [Follow-Up Care section](#) [8].

Learn more about the basics of [chemotherapy](#) [9] and [preparing for treatment](#) [10]. The medications used to treat cancer are continually being evaluated. Talking with your child's doctor is often the best way to learn about the medications prescribed for him or her, their purpose, and their potential side effects or interactions with other medications. Learn more about your child's prescriptions by using [searchable drug databases](#) [11].

## **Radiation therapy**

Radiation therapy is the use of x-rays to destroy cancer cells. A doctor who specializes in giving radiation therapy to treat cancer is called a radiation oncologist. The most common type of radiation treatment is called external-beam radiation therapy, which is radiation therapy given from a machine outside the body. A radiation therapy regimen (schedule) usually consists of a specific number of treatments given over a set period of time.

In the past, treatments for Hodgkin lymphoma used high doses of radiation therapy to all of the lymph node areas. Children treated this way had problems as they got older with muscle and bone growth and had a higher risk of heart disease and second cancers. Today, treatment with radiation therapy alone is never used for children, but low-dose radiation therapy may be given to areas where the lymph nodes contain cancer cells. This approach reduces the amount of radiation therapy to the body compared with previous regimens.

The need for radiation therapy is determined by the stage of disease and how well the disease responds to chemotherapy. Clinical trials are currently in progress to identify patients whose disease can be treated successfully using chemotherapy alone. See the [Latest Research](#) [12] section for more information. However, radiation therapy is a very effective treatment for Hodgkin lymphoma and plays a major role in curing the disease.

In general, short-term side effects from radiation therapy include tiredness, sore throat, dry mouth, mild skin reactions, upset stomach, and loose bowel movements, depending on the parts of the body affected by radiation treatment. Long-term side effects of radiation therapy may include growth problems of bones and soft tissues; dental, thyroid, heart, and lung problems; and second cancers. In particular, girls treated for Hodgkin lymphoma with radiation to the mediastinum (chest area) are at increased risk of breast cancer. Learn more about the basics of [radiation therapy](#) [13].

## **Getting care for symptoms and side effects**

Cancer and its treatment often cause side effects. In addition to treatment to slow, stop, or eliminate the cancer, an important part of cancer care is relieving a person's symptoms and side effects. This approach is called palliative or supportive care, and it includes supporting the patient with his or her physical, emotional, and social needs.

Palliative care is any treatment that focuses on reducing symptoms, improving quality of life,

and supporting patients and their families. Any person, regardless of age or type and stage of cancer, may receive palliative care. It works best when palliative care is started as early as needed in the cancer treatment process. People often receive treatment for the cancer and treatment to ease side effects at the same time. In fact, patients who receive both often have less severe symptoms, better quality of life, and report they are more satisfied with treatment.

Palliative treatments vary widely and often include medication, nutritional changes, relaxation techniques, emotional support, and other therapies. Your child may also receive palliative treatments similar to those meant to eliminate the cancer, such as chemotherapy, surgery, or radiation therapy. Talk with your child's doctor about the goals of each treatment in the treatment plan.

Before treatment begins, talk with your child's health care team about the possible side effects of your child's specific treatment plan and palliative care options. And during and after treatment, be sure to tell your child's doctor or another health care team member if your child is experiencing a problem so it can be addressed as quickly as possible. Learn more about [palliative care](#) [14].

## **Remission and the chance of recurrence**

A remission is when cancer cannot be detected in the body and there are no symptoms. This may also be called having "no evidence of disease" or NED.

A remission may be temporary or permanent. This uncertainty causes many people to worry that the cancer will come back. While many remissions are permanent, it is important to talk with your child's doctor about the possibility of the cancer returning. Understanding the risk of recurrence and the treatment options may help you feel more prepared if the cancer does return. Learn more about [coping with the fear of recurrence](#) [15].

If the cancer does return after the original treatment, it is called recurrent cancer. The disease can come back in the same area in which it began or in a new area of the body.

When this occurs, a cycle of testing will begin again to learn as much as possible about the recurrence. After testing is done, you and your child's doctor will talk about your treatment options. Often the treatment plan will include the treatment described above, such as chemotherapy and radiation therapy, but they may be used in a different combination or given at a different pace. Your child's doctor may also suggest clinical trials that are studying new ways to treat this type of recurrent cancer. Whichever treatment plan you choose, palliative care will be important for relieving symptoms and side effects.

Treatment for recurrent Hodgkin lymphoma depends on where the disease recurs, the type of treatment the child has had previously, and the time since the first treatment was completed. For example, if chemotherapy was given initially, then the child may be given another round of chemotherapy using different drugs.

If the disease has come back very soon after the first treatment or after the use of chemotherapy and radiation therapy, more aggressive therapy, including bone marrow/stem cell transplantation, which is described below, may be recommended to increase the chances of keeping the disease in remission. A combination like Ifosfamide (Cyfos, Ifex, Ifosfamidum) and vinorelbine (Navelbine) is typically used to shrink sites of recurrent disease before stem cell transplantation/bone marrow transplantation.

Another combination that has been shown to have activity in recurrent Hodgkin lymphoma is gemcitabine (Gemzar) and vinorelbine. These are examples of possible drug combinations but other treatment plans are also effective in treating this disease. Such combination names include ICE, MIED, DHAP, ESHPA, APE, and DECAL.

Other, newer treatments that scientists are looking at including monoclonal antibodies, which are a type of targeted therapy. Each monoclonal antibody is directed against a specific protein on the surface of cancer cells, and it does not affect cells that do not have that protein. Targeted therapies being reviewed include rituximab (Rituxan) and brentuximab vedotin (Adcetris). It is important to talk with your child's doctor about which treatment plan is best.

When cancer recurs, patients and their families often experience emotions such as disbelief or fear. Families are encouraged to talk with their health care team about these feelings and ask about support services to help them cope. Learn more about [dealing with cancer recurrence](#) [16].

## **Stem cell transplantation/bone marrow transplant**

Often when high doses of chemotherapy or radiation therapy are used to treat recurrent Hodgkin lymphoma, the bone marrow becomes damaged and cannot produce healthy blood cells. To replace those lost cells, a stem cell transplant may be recommended.

A stem cell transplant is a medical procedure in which bone marrow that contains cancer is replaced by highly specialized cells, called hematopoietic stem cells, that develop into healthy bone marrow. Hematopoietic stem cells are blood-forming cells found both in the bloodstream and in the bone marrow. Today, this procedure is more commonly called a stem cell transplant, rather than bone marrow transplant, because it is the stem cells in the blood that are typically being transplanted, not the actual bone marrow tissue.

Before recommending transplantation, doctors will talk with you about the risks of this treatment and consider several other factors, such as the type of cancer, results of any previous treatment, and your child's age and general health.

There are two types of stem cell transplantation, depending on the source of the blood stem cells: allogeneic (ALLO) and autologous (AUTO). ALLO uses donated stem cells, while AUTO uses the child's own stem cells. An AUTO transplant is most commonly used for Hodgkin lymphoma. An ALLO transplant is not used as frequently for patients with recurrent Hodgkin lymphoma because of the greater risks of serious side effects.

In both types, the goal is to destroy all of the cancer cells in the marrow, blood, and other parts of the body using high doses of chemotherapy and/or radiation therapy and then allow replacement blood stem cells to create healthy bone marrow.

Learn more about the basics of [bone marrow and stem cell transplantation](#) [17].

## If treatment fails

Although treatment is successful for the majority of children with Hodgkin lymphoma, sometimes it is not. If a child's cancer cannot be cured or controlled, this is called advanced or terminal cancer. This diagnosis is stressful, and advanced cancer may be difficult to discuss. However, it is important to have open and honest conversations with your child's doctor and health care team to express your family's feelings, preferences, and concerns. The health care team is there to help, and many team members have special skills, experience, and knowledge to support patients and their families.

Parents or guardians are encouraged to think about where the child would be most comfortable: at home, in a home-like setting elsewhere, in the hospital, or in a hospice environment. Hospice care is a type of palliative care for people who are expected to live less than six months. It is designed to provide the best possible quality of life for people who are near the end of life. Nursing care and special equipment can make staying at home a workable alternative for many families. Some children may be happier if they can arrange to attend school part-time or keep up other activities and social connections. The child's health care team can help parents or guardians decide on an appropriate level of activity. Making sure a child is physically comfortable and free from pain is extremely important as part of end-of-life care. Learn more about [caring for a terminally ill child](#) [18] and [advanced cancer care planning](#) [19].

The death of a child is an enormous tragedy, and families may need support to help them cope with the loss. Pediatric cancer centers often have professional staff and support groups to help with the process of grieving. Learn more on [grieving the loss of a child](#) [20].

*The [next section in this guide is About Clinical Trials](#) [3] and it offers more information about research studies that are focused on finding better ways to care for people with cancer. Or, use the menu on the side of your screen to choose another section to continue reading this guide.*

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## Links

[1] <http://www.cancer.net/cancer-types/lymphoma-hodgkin-childhood/treatment-options>

[2] <http://www.cancer.net/about-us>

[3] <http://www.cancer.net/node/19171>

[4] <http://www.cancer.net/node/25356>

[5] <http://www.cancer.net/node/25116>

[6] <http://www.cancer.net/node/25117>

[7] <http://www.cancer.net/node/24582>

[8] <http://www.cancer.net/node/19173>

- [9] <http://www.cancer.net/node/24723>
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