

Medulloblastoma - Childhood - Treatment Options [1]

This section has been reviewed and approved by the [Cancer.Net Editorial Board](#) [2], 05/2014

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

In general, brain tumors in children are uncommon, so it can be hard for doctors to plan treatments unless they know what has been most effective in other children. That's 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 (the best proven treatments available) with newer approaches to treatments that may be more effective. Clinical trials may test such approaches 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, all children with a CNS tumor should be treated at a specialized cancer center. Doctors at these centers have extensive experience in treating children and have access to the latest research. A doctor who specializes in treating children with cancer is called a pediatric oncologist. 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, nutritionists, physical and occupational therapists, social workers, and counselors. Special activities and programs to help your child and family cope may also be available.

Treatment overview

Treatment options and recommendations depend on several factors, including the type and stage of the tumor, possible side effects, the family's preferences, and the child's overall health. Three types of treatment are typically used to treat medulloblastoma: surgery, radiation therapy, and chemotherapy. Sometimes, the treatments are used in combination. In some situations, stem cell or bone marrow transplantation may be recommended. 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 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](#) [5].

Descriptions of the common treatment options for medulloblastoma are listed below.

Surgery

Surgery is the removal of the tumor and surrounding tissue during an operation. Most commonly, it is the first treatment used for medulloblastoma. In addition to removing or reducing the size of the tumor, surgery can provide a tissue sample to diagnose the tumor, as explained in the [Diagnosis \[6\]](#) section.

Surgery to the brain requires the removal of part of the skull, a procedure called a craniotomy. After the surgeon removes the tumor, the patient's own bone will be used to cover the opening in the skull. There have been rapid advances in surgery for brain tumors. This includes the use of enhanced imaging machines to give surgeons more tools to plan and perform the surgery and cortical mapping, which is a technique that allows doctors to identify certain areas of the brain that control the senses, language, and motor skills.

Some tumors cannot be removed by surgery because of their location; these tumors are called inoperable. In these situations, the doctor will recommend other treatment options. If the tumor is cancerous, even if the cancer cannot be cured, its removal can relieve symptoms caused by the tumor pressing on the brain.

Side effects from surgery for medulloblastoma can vary. Parents are encouraged to talk about possible short-term and long-term side effects with their child's doctor before surgery. Occasionally the surgeon will place a plastic tube called a shunt to move the fluid made inside the brain to the abdomen so that the fluid does not build up in the brain and cause problems. In most instances, the placement of a shunt is safe and most children do not have any problems from the procedure. Patients and their parents are encouraged to talk with the doctor about the possible side effects from placing a shunt.

Learn more about [surgery \[7\]](#).

Radiation therapy

Radiation therapy is the use of high-energy x-rays or other particles to destroy tumor cells. A doctor who specializes in giving radiation therapy to treat a tumor is called a radiation oncologist. The most common type of radiation treatment is called external-beam radiation therapy, which is radiation given from a machine outside the body. When radiation treatment is given using implants, it is called internal radiation therapy or brachytherapy. A radiation therapy regimen (schedule) usually consists of a specific number of treatments given over a set period of time.

A type of radiation therapy that may be used for medulloblastoma is proton therapy. Proton therapy is a type of external-beam radiation therapy that uses protons rather than x-rays. At high energy, protons can destroy tumor cells. Proton therapy is becoming more widely used in the United States.

Because radiation therapy can sometimes interfere with the normal growth and development of a child's brain and spine, the doctor may choose to treat the tumor in another way. If radiation

therapy is recommended, the approach will be based on the child's age. For children older than three, radiation therapy includes a moderate dose to the entire brain and spine, followed by a higher dose aimed directly at the tumor and the surrounding area or the back part of the brain. For children younger than three, radiation therapy may be limited to the back part of the brain or the tumor and the surrounding area after surgery and chemotherapy (see below).

Short term side effects from radiation therapy may include fatigue, mild skin reactions, upset stomach, and loose bowel movements. Most of these side effects go away soon after treatment is finished. Long-term side effects of radiation therapy may include problems with growth, hormone deficiencies, and problems with learning, especially higher education.

Learn more about [radiation therapy](#) [8].

Chemotherapy

Chemotherapy is the use of drugs to destroy tumor cells, usually by stopping the tumor cells' ability to grow and divide. Chemotherapy is given by a pediatric oncologist or a medical oncologist, a doctor who specializes in treating a tumor with medication.

Systemic chemotherapy is delivered through the bloodstream to reach tumor 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 (orally). It can also be given by injection into a muscle or directly into the cerebrospinal fluid, which is fluid that circulates around the brain and spinal cord. A chemotherapy regime (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.

Researchers are studying ways to use chemotherapy before, during, or after radiation therapy, as the two types of treatment may work better to treat the tumor when combined. High-dose chemotherapy may be used before or instead of radiation therapy for children younger than three to four years old. Several cycles of high-dose chemotherapy may be used before or after radiation therapy in children older than three to four years old. High-dose chemotherapy works best when there is little tumor left after surgery.

The side effects of chemotherapy depend on the individual and the dose used, but they can include fatigue, risk of infection, nausea and vomiting, hair loss, loss of appetite, and diarrhea. These side effects usually go away once treatment is finished.

Learn more about [chemotherapy](#) [9] and [preparing for treatment](#) [10]. The medications used to treat cancer are continually being evaluated. Talking with the doctor is often the best way to learn about the medications prescribed for your child, 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].

Stem cell transplantation/bone marrow transplantation

A stem cell/bone marrow transplant may be used for children with recurrent medulloblastoma. A stem cell transplant is a medical procedure in which bone marrow that contains tumor cells 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 the patient about the risks of this treatment and consider several other factors, such as the type of tumor, results of any previous treatment, and patient's age and general health.

There are two types of stem cell transplantation depending on the source of the replacement blood stem cells: allogeneic (ALLO) and autologous (AUTO). ALLO uses donated stem cells, while AUTO uses the patient's own stem cells. Only AUTO transplantation is used to treat medulloblastoma.

The goal is to destroy all of the tumor 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 [stem cell and bone marrow transplantation](#) [12].

Getting care for symptoms and side effects

A brain tumor and its treatment often causes side effects. In addition to treatment to slow, stop, or eliminate the tumor, an important part of 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 can help a person at any stage of illness. People often receive treatment for the tumor 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 families report they are more satisfied with treatment.

Palliative treatments vary widely and often include medication, nutritional changes, relaxation techniques, and other therapies. Your child may also receive palliative treatments similar to those meant to eliminate the disease, such as chemotherapy, surgery, and 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 supportive 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 is addressed as quickly as possible. Learn more about [palliative care](#) [13].

Remission and the chance of recurrence

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

A remission can be temporary or permanent. This uncertainty leads to many people feeling worried or anxious that the tumor will come back. While many remissions are permanent, it's important to talk with your child's doctor about the possibility of the tumor returning. Understanding the risk of recurrence and the treatment options may help you feel more prepared if the disease does return. Learn more about [coping with the fear of recurrence](#) [14].

If the tumor does return after the original treatment, it is called a recurrent tumor. It may come back in the same place (called a local recurrence), nearby (regional recurrence), or in another place (distant recurrence).

When this occurs, a cycle of testing will begin again to learn as much as possible about the recurrence, including whether the tumor's stage has changed. After testing is done, you and your child's doctor will talk about the treatment options. Often the treatment plan will include the therapies described above such as surgery, radiation therapy, or chemotherapy, 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 tumor.

Treatment of recurrent medulloblastoma depends on two factors:

- Whether the tumor recurred in the place where it began or in another part of the brain
- The type of treatment the child received for the original tumor

Depending on each child's situation, the doctor may recommend surgery, radiation therapy, chemotherapy, and/or stem cell/bone marrow transplantation. High-dose chemotherapy may be a part of treatment for children with recurrent medulloblastoma. Salvage chemotherapy refers to the use of chemotherapy for a patient who experiences a recurrence of cancer following initial treatment, in the hope of providing a cure or prolonging life.

If your child is diagnosed with a recurrence, you and your family may experience emotions such as disbelief or fear. You are encouraged to talk with your child's health care team about these feelings and ask about support services to help your family cope. Learn more about [dealing with a recurrence](#) [15].

If treatment fails

Although treatment is successful for the majority of children with a brain tumor, sometimes it is not. If a child's tumor cannot be cured or controlled, this is called advanced or terminal cancer. This diagnosis is stressful, and it 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](#) [16] and [advanced care planning](#) [17].

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](#) [18].

The next section helps explain clinical trials, which are research studies. Use the menu on the side of your screen to select About Clinical Trials, or you can select another section, to continue reading this guide.

Links:

- [1] <http://www.cancer.net/cancer-types/medulloblastoma-childhood/treatment-options>
- [2] <http://www.cancer.net/about-us>
- [3] <http://www.cancer.net/node/19245>
- [4] <http://www.cancer.net/node/24957>
- [5] <http://www.cancer.net/node/24582>
- [6] <http://www.cancer.net/node/19242>
- [7] <http://www.cancer.net/node/24720>
- [8] <http://www.cancer.net/node/24728>
- [9] <http://www.cancer.net/node/24723>
- [10] <http://www.cancer.net/node/24473>
- [11] <http://www.cancer.net/node/25369>
- [12] <http://www.cancer.net/node/24717>
- [13] <http://www.cancer.net/node/25282>
- [14] <http://www.cancer.net/node/25241>
- [15] <http://www.cancer.net/node/25042>
- [16] <http://www.cancer.net/node/25280>
- [17] <http://www.cancer.net/node/25113>
- [18] <http://www.cancer.net/node/25288>