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# Brain Tumours

*Understanding your diagnosis*



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# Brain Tumours

## *Understanding your diagnosis*

When you first hear that you have cancer, you may feel alone and afraid. You may be overwhelmed by the large amount of information you have to take in and the decisions you need to make.

“ *All I could hear was ‘cancer.’ I heard my doctor say something like, ‘We’re going to try to get the surgery done as soon as possible.’ I didn’t hear one word after that.* ”

The introductory information in this brochure can help you and your family take the first steps in learning about primary malignant brain tumours (cancer that starts in the brain). A better understanding may give you a feeling of control and help you work with your healthcare team to choose the best care for you.

### **For more information**

You can find more in-depth information about brain tumours on [cancer.ca](http://cancer.ca). Or call us at 1-888-939-3333 to learn more about cancer, diagnosis, treatment, support and services near you.

## What is cancer?

Cancer is a disease that starts in our cells. Our bodies are made up of trillions of cells, grouped together to form tissues and organs such as muscles and bones, the lungs and the liver. Genes inside each cell tell it to grow, work, divide and die. Normally, our cells follow these instructions and we remain healthy.

But sometimes the instructions in some cells get mixed up and the cells behave abnormally. These cells start to grow and divide uncontrollably. After a while, a group of abnormal cells forms a lump, or tumour.

Tumours can be either non-cancerous (benign) or cancerous (malignant). Non-cancerous tumour cells stay in one place in the body. Cancerous tumour cells can grow into nearby tissues.

## What are brain tumours?

A brain tumour is a group of abnormal cells in the brain. Primary brain tumours start in the brain and can be either non-cancerous or cancerous. In most parts of the body, a non-cancerous tumour is not as serious as a cancerous tumour. But in the brain, both non-cancerous and cancerous tumours can be serious and possibly life-threatening.

Non-cancerous brain tumours do not have cancer cells and don't spread to nearby tissues. But they can grow and press on certain parts of the brain, causing serious health problems.

Primary malignant brain tumours do have cancer cells. They tend to grow quickly, increasing pressure in the brain. They can also spread to other parts of the brain or to the spinal cord. These tumours are serious and often life-threatening.

## The brain

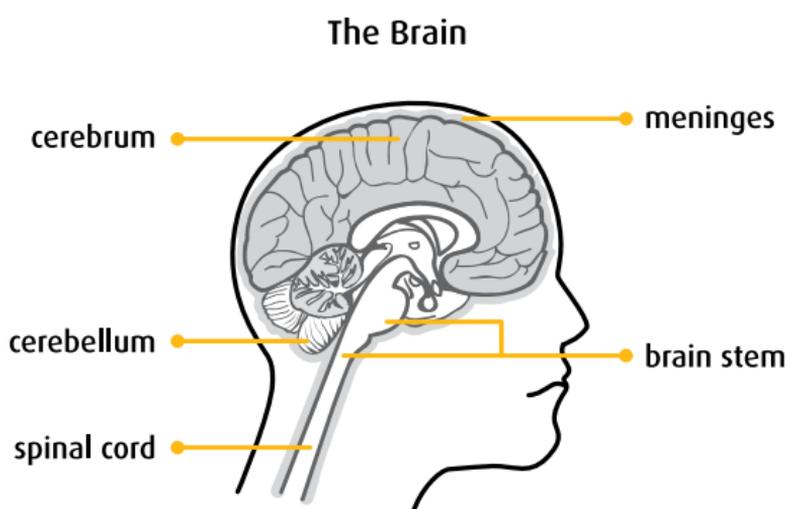
The brain is a soft mass of nerve tissue. It controls your body. Three main parts of the brain control the different activities you do:

- The cerebrum is the largest part of the brain. It has 2 halves, called hemispheres. The right side of the brain controls the left side of your body, and the left side of the brain controls the right side of your body. You use the cerebrum to see, feel, think, speak and move. Your senses, such as touch or taste, send messages to the cerebrum to tell it what is happening and how to respond. It also controls thinking and memory.

- The cerebellum is under the cerebrum at the back of the brain. The cerebellum controls balance and coordination.
- The brain stem is at the bottom of the brain and connects the brain to the spinal cord. It controls basic body functions, including blood pressure, heartbeat and breathing.

The brain is wrapped in thin membranes called meninges. A watery fluid called cerebrospinal fluid fills the spaces between the meninges and cushions the brain. The brain is protected by the skull, which is made of bone.

The brain has 2 types of cells - nerve cells (neurons) and glial cells. The nerve cells send messages between the brain and the rest of the body. Glial cells surround the nerve cells and hold them in place. There are many different types of brain tumours, but most adult brain tumours start in the glial cells. These types of tumours are called gliomas.



## Diagnosing brain tumours

Your doctor may suspect you have a brain tumour after hearing about your symptoms, taking your medical history and doing a physical exam. To find out for sure, your doctor will arrange special tests. These tests may also be used to help plan treatment.

The signs and symptoms of brain tumours vary depending on where the tumour is in the brain. They may also be caused by pressure on the brain. The skull is hard and can't expand, so pressure within the skull can damage or destroy brain cells as a tumour grows.

**Symptoms of brain tumours:** The most common symptom of a brain tumour is a headache. Headaches are usually worse in the morning and may go away after vomiting. Other symptoms include:

- muscle jerking or twitching (seizures or convulsions)
- digestive problems, such as nausea, vomiting or loss of appetite
- changes in mood, emotions, personality or social skills
- not being able to concentrate
- problems with memory, behaviour and judgment
- abnormal movements or body positions
- problems walking or eating
- weakness on one side of the body or numbness in parts of the body
- changes in speech, hearing or vision

- dizziness or problems with balance
- fatigue
- being confused

The process of diagnosing cancer may seem long and frustrating. But other health problems can cause some of the same symptoms. The doctor has to make sure there are no other possible reasons for a health problem.

Your doctor will do one or more of the following tests to make a diagnosis.

**Imaging tests:** The healthcare team uses MRIs, CT scans, PET scans, x-rays, ultrasounds or bone scans to look at your tissues, organs and bones in more detail. They can see the size of the tumour and if it has spread. These tests are usually painless, and you don't need an anesthetic (freezing).

**Biopsy:** A biopsy is usually needed to make a definite diagnosis of cancer. Cells are taken from the body and checked under a microscope. If the cells are cancerous, they will be studied more to see how fast they are growing. There are many ways to do a biopsy.

- A surgical (open) biopsy is used for tumours that can be easily reached by surgery. A small section of the skull is removed so the surgeon can access the brain. A needle is used to remove tissue samples, or the whole tumour may be removed. You may be given either a local anesthetic (freezing) or general anesthetic (you will be unconscious).

- An endoscopic third ventriculostomy (ETV) uses an endoscope to explore the fluid-filled chambers (ventricles) of the brain. The endoscope is a thin, flexible tube used to take a biopsy sample or remove tumours inside the ventricles.
- A stereotactic (closed) biopsy is used for tumours that are hard to reach. You will be given a local anesthetic to numb your scalp. A special frame is fastened to your head. The frame is used to help guide a thin needle through a small hole to remove a small sample of tissue from the tumour. The surgeon may use MRI or CT scans to guide the needle.
- A lumbar puncture (also called a spinal tap) is a biopsy that removes a small amount of cerebrospinal fluid to check for cancer cells. A needle is inserted between 2 vertebrae in the backbone, and a small amount of the fluid that surrounds the spinal cord is removed.

**Further testing:** Your doctor may order more tests to find out if the cancer has spread and to help plan your treatment.

## Will I be OK?

Most people with cancer want to know what to expect. Can they be cured?

A prognosis is your doctor's best estimate of how cancer will affect you and how it will respond to treatment. It looks at many factors including:

- the type and grade of the cancer
- the location of the tumour and whether it has spread
- your age, sex and overall health

Even with all this information, it can still be very hard for your doctor to say exactly what will happen. Each person's situation is different.

Your doctor is the only person who can give a prognosis. Ask your doctor about the factors that affect your prognosis and what they mean for you.

## Grading

Once a diagnosis of cancer has been made, the cancer is given a grade. This information helps you and your healthcare team choose the best treatment for you.

A grade is given based on how the cancer cells look and act compared with normal cells. To find out the grade of a tumour, a biopsy sample is looked at under a microscope.

Usually, brain cancer tumours are given a grade from 1 to 4.

Grades 1 and 2 are low grade. **Low grade** means that the cancer cells look and act much like normal cells. They tend to be slow growing and are less likely to spread.

Grades 3 and 4 are high grade. **High grade** means that the cancer cells look and act less normal, or more abnormal. They tend to grow more quickly and are more likely to spread.

## Treatments for brain tumours

Your healthcare team considers your general health and the type and grade of the cancer to recommend the best treatments for you. You'll work together with your healthcare team to make the final treatment choices. Talk to them if you have questions or concerns.

For brain tumours, you might receive one or more of the following treatments.

**Surgery:** A decision to have surgery depends on the size of the tumour and where it is. Surgery is the most common treatment for a brain tumour. Surgery to open the skull is called a craniotomy. The surgeon makes a small cut in the scalp and removes a piece of skull. All or part of the tumour is removed, and then the bone and skin of the scalp are put back in place to heal. You will have a general anesthetic but you may need to be awake for part of the surgery.

You may stay in the hospital for several days or longer after the surgery. It can take weeks to recover fully from a brain operation. You may have a headache when you wake up. Painkillers can help control the pain. Your eyes and face may be swollen and bruised. These side effects are temporary and should disappear within a few days. A tube may be inserted in the scalp to drain excess blood from the wound. It is usually removed a day or 2 after the operation.

The tumour itself and the surgery to remove it can damage healthy brain tissue. Damaged

nerve cells may cause different neurological problems such as changes in movement, memory or speech. Physical therapy, cognitive therapy or speech therapy can help you cope with some of the neurological problems you may have had before treatment or new ones that develop after surgery.

**Radiation therapy:** In external beam radiation therapy, a large machine is used to carefully aim a beam of radiation at the tumour. The radiation damages cells that are in the path of the beam – both cancer cells and normal cells. Radiation therapy may be used to treat the tumour or to control symptoms.

Radiation side effects depend on what part of the body receives the radiation. You may feel more tired than usual, notice changes to the skin (it may be red and tender) or have thinning hair. You may also feel tired or confused for a few weeks after radiation for a brain tumour. Sometimes, radiation causes the brain to swell during the first few treatments. The swelling is usually prevented or treated with corticosteroid drugs.

**Chemotherapy:** Chemotherapy uses drugs to treat cancer. Chemotherapy drugs may be given as pills or injected with a needle into a vein. They damage cancer cells, but they also damage some healthy cells. Although healthy cells can recover over time, you may have side effects from your treatment, like fatigue, loss of appetite, nausea, vomiting, hair loss or an increased risk of infection.

**Targeted therapy:** Targeted therapy uses drugs or other substances to find and attack specific cancer cells without damaging healthy cells. These drugs stop the growth of cancer cells and the growth of blood vessels to the tumour. Targeted therapy for brain tumours is given intravenously (injected into a vein).

You may have some side effects from targeted therapy, such as high blood pressure, flu-like symptoms, fatigue, diarrhea or constipation, sore mouth or skin infections. These are usually temporary and can be treated.

**For more information on treatment**, you may want to read our booklets *Chemotherapy and Other Drug Therapies* and *Radiation Therapy*.

**Clinical trials:** Clinical trials test new ways to treat cancer, such as new drugs, types of treatments or combinations of treatments. They provide information about the safety and effectiveness of new approaches to see if they should become widely available. Ask your doctor if any clinical trials are available that could be a treatment option for you. You may benefit and so may future cancer patients.

**Our brochure** *Clinical Trials* has more information, including how to find a clinical trial.

**Complementary therapies:** Complementary therapies – for example, massage therapy or acupuncture – are used *together with* conventional cancer treatments, often to help ease tension, stress and other side effects of

treatment. They don't treat the cancer itself. More research is needed to understand if these therapies are effective and how they work.

If you're thinking about using a complementary therapy, learn as much as you can about the therapy and talk to your healthcare team. It's possible that the therapy might affect other treatments or test results.

Alternative therapies are used *instead of* conventional treatments. Alternative therapies haven't been tested enough for safety or effectiveness. Using alternative treatments alone for cancer may have serious health effects. Talk to your healthcare team before you try an alternative therapy.

**Our booklet** *Complementary Therapies* has more information.

### **Treating some symptoms of brain tumours:**

There are a number of ways to help ease these symptoms.

- Seizures - Antiseizure medicines (anticonvulsants) are given to prevent further seizures in people with brain tumours who've already had a seizure.
- Brain swelling - Corticosteroids are often used to reduce swelling around brain tumours. They may be used before or after surgery, or during or after radiation therapy. Your doctor will discuss with you how to reduce the doses over time.

- Swallowing problems – Try eating foods with soft textures and take only small bites. It may be easier to eat small meals and snacks throughout the day rather than eating 3 large meals. Drink plenty of fluids every day. Speech therapy may help with swallowing problems too.
- Depression – Changes in your way of thinking when you have brain cancer may make understanding and coping with depression even more difficult. But depression can and should be treated. Talk to a member of your healthcare team. You may need medicine or therapy.

### **Side effects of treatments**

Some cancer treatments cause side effects, such as fatigue, hair loss or nausea. Because treatments affect everyone differently, it's hard to predict which side effects – if any – you may have.

Side effects can often be well managed and even prevented. If you're worried about side effects, tell your healthcare team about your concerns and ask questions. They can tell you which side effects you should report right away and which ones can wait until your next visit.

If you notice any side effects or symptoms that you didn't expect, talk to a member of your healthcare team as soon as possible. They'll help you get the care and information you need.

## Living with cancer

Many sources of help are available for people with cancer and their caregivers.

**Our booklet** *Coping When You Have Cancer* has more detailed information and resources.

**Your healthcare team:** If you need practical help or emotional support, members of your healthcare team may be able to suggest services in your community or refer you to cancer centre staff or mental health professionals.

**Family and friends:** People closest to you can be very supportive. Accept offers of help. When someone says, “Let me know how I can help,” tell them what they can do. Maybe they can run errands, cook a meal or drive you to your doctor’s office.

**People who’ve had a similar experience:** Talking with and learning from others who’ve had similar experiences can be helpful. Consider visiting a support group or talking with a cancer survivor in person, over the telephone or online. Try more than one option to see which one works best for you.

**Yourself:** Coping well with cancer doesn’t mean that you have to be happy or cheerful all the time. But it can mean looking after yourself by finding relaxing, enjoyable activities that refresh you mentally, spiritually or physically. Take some time to find ways to cope. You may also want to talk to a counsellor for more help.

## **Talking to someone who's been there**

If you would like to talk to someone who's had a similar cancer experience, you can connect by phone with a trained volunteer who will listen, provide hope and suggest ideas for coping – all from the shared perspective of someone who's been there.

Register for this free program at [match.cancer.ca](http://match.cancer.ca) or call us at 1-888-939-3333.

## **Want to connect with people online?**

If you'd like to join our online community, visit [CancerConnection.ca](http://CancerConnection.ca). You can read news, join discussion groups that interest you, get support and help others at the same time. You'll find caring, supportive people there.

## **After treatment**

Follow-up care helps you and your healthcare team follow your progress and your recovery from treatment. At first, you might meet with one of the specialists from your healthcare team. Later on, it may be your family doctor.

The schedule of follow-up visits is different for each person. You might see your doctor more often in the first year after treatment and less often after that. After treatment has ended, you should report new symptoms or symptoms that don't go away to your doctor right away, without waiting for your next scheduled visit.

The end of cancer treatment may bring mixed emotions. You may be glad the treatments are over and look forward to returning to your normal activities. But you could feel anxious

as well. If you're worried about your treatment ending, talk to your healthcare team. They can help you through this transition period.

Adjusting to life after cancer treatment is an important part of your care, especially if the brain tumour or its treatment has affected your everyday activities. Before your treatment, your healthcare team will discuss with you what you can expect. They can answer any questions you may have about lifestyle changes and can suggest ways to help you maintain your quality of life. Rehabilitation is an important part of returning to the activities of daily living after treatment for a brain tumour. Recovery is different for each person. Your healthcare team will plan a rehabilitation program that's right for you.

**Rehabilitation after treatment:** Brain tumours and their treatments can affect your physical abilities or mental skills. You may have problems thinking, seeing or speaking. Or you may have personality changes or seizures. These neurological problems may lessen or disappear with time, but sometimes damage to the brain is permanent. You may need physical, cognitive or speech therapy.

- **Physical therapy** - Physiotherapists can help you regain strength and balance if you are weak or have problems with balance. If you can't move (have paralysis), a physiotherapist may be able to help you regain some movement. Occupational therapists can help you learn to manage daily activities, such as eating, bathing and dressing.

- **Cognitive therapy** – Professionals can help you regain mental skills (such as reason and memory). You may also learn ways to make up for skills that you've lost. Emotional and personality changes are also common in people with brain tumours. You may have mood swings or be depressed, irritable or anxious. Counselling can help you and your family cope with the changes.
- **Speech therapy** – Speech therapists can help if you have trouble speaking, expressing thoughts or swallowing.

## What causes brain tumours?

There is no single cause of brain tumours, but some factors increase the risk of developing one. Some people can develop cancer without any risk factors, while others have some of these factors but do not get cancer.

Risk factors for brain tumours include:

- previous radiation to the head, such as CT scans or x-rays, or radiation therapy
- certain genetic conditions, such as neurofibromatosis, von Hippel-Lindau syndrome or Li-Fraumeni syndrome
- a family history of brain tumours
- treatment for cancer in childhood
- a weakened immune system, for example, from an organ transplant or other cancer treatment

Brain tumours are one of the more common cancers diagnosed in children, and they tend to happen less often in people 70 years and

older. But they can be diagnosed at any age. Most types of brain tumours are more common in men than women.

## Canadian Cancer Society

*We're here for you.*

When you have questions about treatment, diagnosis, care or services, we will help you find answers.

**Call our toll-free number 1 888 939-3333.**



**Ask** a trained cancer information specialist your questions about cancer. Call us or email [info@cis.cancer.ca](mailto:info@cis.cancer.ca).



**Connect** with people online to join discussions, get support and help others. Visit [CancerConnection.ca](http://CancerConnection.ca).



**Browse** Canada's most trusted online source of information on all types of cancer. Visit [cancer.ca](http://cancer.ca).

Our services are free and confidential. Many are available in other languages through interpreters.

### Tell us what you think

Email [cancerinfo@cancer.ca](mailto:cancerinfo@cancer.ca) and tell us how we can make this publication better.



## What we do

The Canadian Cancer Society fights cancer by:

- doing everything we can to prevent cancer
- funding research to outsmart cancer
- empowering, informing and supporting Canadians living with cancer
- advocating for public policies to improve the health of Canadians
- rallying Canadians to get involved in the fight against cancer

Contact us for up-to-date information about cancer and our services or to make a donation.



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