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Brain and Spinal Cord Tumor in Adults

Early Detection, Diagnosis, and Staging

Learn about the signs and symptoms of brain and spinal cord tumors in adults. Find out about tests that may be done for brain and spinal cord tumors.

Detection and Diagnosis

Catching tumors early often allows for more treatment options. Some early tumors may have signs and symptoms that can be noticed, but this is not always the case.

- [Can Brain and Spinal Cord Tumors in Adults Be Found Early?](#)

Can Brain and Spinal Cord Tumors in Adults Be Found Early?

- [People with inherited syndromes](#)

At this time there are no widely recommended tests to screen for brain and spinal cord tumors. (Screening is testing for a disease in people who have no symptoms.) Most brain tumors are found when a person goes to a doctor because of [signs or symptoms](#) they are having.

Most often, the outlook for people with a brain or spinal cord tumor depends on their age, the type of tumor, and its location, not by how early it is detected. But as with any disease, earlier detection and treatment is likely to be helpful.

People with inherited syndromes

For people with certain [inherited syndromes](#)¹ (such as neurofibromatosis or tuberous sclerosis) that put them at higher risk for brain tumors, doctors often recommend frequent physical exams and other tests starting when they are young. In some cases these tests can find tumors when they are still small. Not all tumors related to these syndromes may need to be treated right away, but finding them early might help doctors monitor them so that they can be treated quickly if they begin to grow or cause problems.

Hyperlinks

1. www.cancer.org/cancer/types/brain-spinal-cord-tumors-adults/causes-risks-prevention/risk-factors.html

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Signs and Symptoms of Adult Brain and Spinal Cord Tumors

- **Headache**
 - **Nausea**
 - **Vomiting**
- Blurred vision**

or pain, or trouble swallowing.

Spinal cord tumors can cause **numbness, weakness, or lack of coordination in**

Tests for Brain and Spinal Cord Tumors in Adults

- [Imaging tests](#)
- [Brain or spinal cord tumor biopsy](#)
- [Lumbar puncture \(spinal tap\)](#)
- [Blood and urine tests](#)

Medical history and physical exam

If signs or symptoms suggest you might have a brain or spinal cord tumor, your doctor will ask about your medical history, focusing on your symptoms and when they began. The doctor will also check your brain and spinal cord function by testing things like your reflexes, muscle strength, vision, eye and mouth movement, coordination, balance, and alertness.

If the results of the exam are abnormal, you may be referred to a **neurologist** (a doctor who specializes in medical treatment of nervous system diseases) or a **neurosurgeon** (a doctor who specializes in surgical treatment of nervous system diseases), who will do a more detailed neurologic exam and may order other tests.

Imaging tests

Your doctor may order one or more imaging tests. These tests use x-rays, strong magnets, or radioactive substances to create pictures of the brain and spinal cord.

Magnetic resonance imaging (MRI) and computed tomography (CT) scans are used most often to look for brain diseases. These scans will almost always show a brain tumor, if one is present. Doctors can often also get an idea about what type of tumor it might be, based on how it looks on the scan and where it is in the brain.

Magnetic resonance imaging (MRI) scan

Special types of MRI can be useful in some situations:

Magnetic resonance angiography (MRA) and magnetic resonance venography (MRV): These special types of MRI may be used to look at the blood vessels in the brain. This can be very useful before [surgery](#)² to help the surgeon plan an operation.

Magnetic resonance spectroscopy (MRS): This test can be done as part of an MRI. It measures biochemical changes in an area of the brain (displayed in graph-like results called **spectra**, although basic images can also be created). By comparing the results for a tumor to that of normal brain tissue, it can sometimes help determine the type of tumor (or how quickly it is likely to grow), although a biopsy of the tumor is often still needed to get an accurate diagnosis. MRS can also be used after treatment to help determine if an area that still looks abnormal on another test is remaining tumor or if it is more likely to be scar tissue.

Magnetic resonance perfusion: For this test, also known as **perfusion MRI**, a contrast dye is injected quickly into a vein. A special type of MR image is then obtained to look at the amount of blood going through different parts of the brain and tumor. Tumors often have a bigger blood supply than normal areas of the brain. A faster growing tumor may need more blood.

Perfusion MRI can give doctors an idea of the best place to take a biopsy. It can also be used after treatment to help determine if an area that still looks abnormal is remaining tumor or if it is more likely to be scar tissue.

Functional MRI (fMRI): This test looks for tiny blood flow changes in an active part of the brain. It can be used to determine what part of the brain handles a function such as speech, thought, sensation, or movement. Doctors can use this to help determine which parts of the brain to avoid when planning [surgery](#)³ or [radiation therapy](#)⁴.

This test is similar to a standard MRI, except that you will be asked to do specific tasks (such as answering simple questions or moving your fingers) while the scans are being done.

Computed tomography (CT) scan

A [CT scan](#)⁵ uses x-rays to make detailed cross-sectional images of your brain and spinal cord (or other parts of the body). Unactiv 0 0 ru(su0 0vo3 to mion46 3snswe /G 72 7raiunand)Tj

(such as in people who are very overweight or people who have a fear of enclosed spaces). CT scans also show greater detail of the bone structures near the tumor.

As with MRI, you may get an injection of a contrast dye through an IV (intravenous) line before the scan (although a different dye is used for CT scans). This helps better outline any tumors that are present.

CT angiography (CTA): For this test, you are injected with a contrast material through an IV line while you are in the CT scanner. The scan creates detailed images of the

Sometimes, a tumor may look so characteristically obvious on an MRI scan (for example, clearly looking like an astrocytoma) that a biopsy is not needed, especially if the tumor is in a part of the brain that would make it hard to biopsy (such as the brain stem). In rare cases a PET scan or MR spectroscopy may give enough information so that a biopsy is not needed.

The 2 main types of biopsies for brain tumors are:

Stereotactic (needle) biopsy

This type of biopsy may be used if, based on imaging tests, surgery to remove the tumor might be too risky (such as with some tumors in vital areas, those deep within the brain, or other tumors that probably can't be removed safely with surgery) but a sample is still needed to make a diagnosis.

The patient may be asleep (under general anesthesia) or awake during the biopsy. If the patient is awake, the neurosurgeon injects a local anesthetic into areas of skin above the skull to numb them. (The skull and brain do not feel pain.)

The biopsy itself can be done in two main ways:

- One approach is to get an MRI or CT, and then use either markers (each about the size of a nickel) placed on different parts of the scalp, or facial and scalp contours, to create a map of the inside of the head. An incision (cut) is then made in the scalp, and a small hole is drilled in the skull. An image-guidance system is then used to direct a hollow needle into the tumor to remove small pieces of tissue.
- In an approach that's being used less often, a rigid frame is attached to the head. An MRI or CT scan is often used along with the frame to help the neurosurgeon guide a hollow needle into the tumor. This also requires an incision in the scalp and a small hole in the skull.

The removed tissue is sent to a pathologist (a doctor specializing in diagnosis of diseases by lab tests). Sometimes it might need to be looked at by a neuropathologist, a pathologist who specializes in nervous system diseases. The pathologist looks at it under a microscope (and might do other lab tests) to determine if the tumor is benign or malignant (cancerous) and exactly what type of tumor it is. This is very important in determining a person's prognosis (outlook) and the best course of [treatment](#)⁸. A preliminary diagnosis might be available the same day, although it often takes at least a few days to get a final diagnosis.

Surgical or open biopsy (craniotomy)

If imaging tests show the tumor can likely be treated with surgery, the neurosurgeon may not do a needle biopsy. Instead, an operation called a **craniotomy**

This fluid is sent to a lab to be looked at for cancer cells. Other tests may be done on the fluid as well.

Lumbar punctures are usually very safe, but doctors have to make sure the test does not result in a large drop in fluid pressure inside the skull, which could possibly cause serious problems. For this reason, imaging tests such as CT or MRI scans are done first.

Lumbar punctures usually aren't done to diagnose brain tumors, but they may be done to help determine the extent of a tumor by looking for cancer cells in the CSF. They are often used if a tumor has already been diagnosed as a type that can commonly spread through the CSF, such as an ependymoma. Lumbar punctures are particularly important in people with suspected brain lymphomas because lymphoma cells often spread into the CSF.

Blood and urine tests

These lab tests rarely are part of the actual diagnosis of brain and spinal cord tumors, but they may be done to check how well the liver, kidneys, and some other organs are

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Last Revised: August 8, 2024

Brain and Spinal Cord Tumors in Adults:

Prognostic Factors

Hyperlinks

1. www.cancer.org/cancer/types/brain-spinal-cord-tumors-adults/about/types-of-brain-tumors.html
2. www.cancer.org/cancer/types/brain-spinal-cord-tumors-adults/about/types-of-brain-tumors.html
3. www.cancer.org/cancer/types/brain-spinal-cord-tumors-adults/treating/surgery.html

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Last Revised: May 5, 2020

Survival Rates for Selected Adult Brain and Spinal Cord Tumors

- [What is a 5-year relative survival rate?](#)
- [Survival rates for more common adult brain and spinal cord tumors](#)
- [Understanding the numbers](#)

Survival rates can give you an idea of what percentage of people with the same type of brain or spinal cord tumor are still alive a certain amount of time (such as 5 years) after they were diagnosed. They can't tell you how long you will live, but they may help give you a better understanding of how likely it is that your treatment will be successful.

Keep in mind that survival rates are estimates and are often based on previous outcomes of large numbers of people who had a specific type of tumor, but they can't predict what will happen in any particular person's case. These statistics can be confusing and may lead you to have more questions. Your doctor is familiar with your situation; ask how these numbers may apply to you.

What is a 5-year relative survival rate?

A **relative survival rate** compares people with the same type of tumor to people in the overall population. For example, if the **5-year relative survival rate** for a specific type of brain tumor is 70%, it means that people who have that tumor are, on average, about 70% as likely as people who don't have that tumor to live for at least 5 years after being diagnosed.

Survival rates for more common adult brain and spinal cord tumors

The numbers in the table come from the Central Brain Tumor Registry of the United States (CBTRUS) and are based on people who were treated between 2001 and 2015. As can be seen below, survival rates for some types of brain and spinal cord tumors can vary widely by age, with younger people tending to have better outlooks than older people. The survival rates for those 65 or older are generally lower than the rates for the ages listed below.

These numbers are for some of the more common types of brain and spinal cord tumors. Accurate numbers are not readily available for all types of tumors, often because they are rare or are hard to classify.

Type of Tumor	5-Year Relative Survival Rate
	Age

	20-44	45-54	55-64
Low-grade (diffuse) astrocytoma	73%	46%	26%
Anaplastic astrocytoma	58%	29%	15%
Glioblastoma	22%	9%	6%
Oligodendroglioma	90%	82%	69%
Anaplastic oligodendroglioma	76%	67%	45%
Ependymoma/anaplastic ependymoma	92%	90%	87%
Meningioma	84%	79%	74%

Understanding the numbers

- **These numbers don't take everything into account.** Survival rates are grouped here based on tumor type and a person's age. But [other factors](#), such as the location of the tumor, whether it can be removed (or destroyed) completely, and if the tumor cells have certain gene or chromosome changes, can also affect your outlook.
- **People now being diagnosed with brain or spinal cord tumors may have a better outlook than these numbers show.** Treatments improve over time, and these numbers are based on people who were diagnosed and treated at least five years earlier.
- Remember, **these survival rates can't predict what will happen to any individual person.** If you find these statistics are confusing and you have more questions, talk to your doctor to better understand your specific situation.

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Questions to Ask About Adult Brain and Spinal Cord Tumors

It's important for you to be able to have honest, open discussions with your cancer care team. Ask any question, no matter how small it might seem. Here are some you might want to ask, but be sure to add your own questions as you think of them.

When you're told you have a brain or spinal cord tumor

- What [kind of tumor](#)¹ do I have?
- Is the tumor benign or malignant? What does this mean?
- Where in the brain or spinal cord is the tumor? Has it grown into nearby areas?
- Will I need any other [tests](#) before we can decide on treatment?
- Will I need to see any other types of doctors?

When deciding on a treatment plan

- How much experience do you have treating this type of tumor?
- What are my [treatment choices](#)²? What do you recommend? Why?
- Should I get a [second opinion](#)³? Can you recommend a doctor or treatment center?
- How soon do we need to [start treatment](#)⁴?
- What's the goal of treatment (cure, prolonging life, relieving symptoms, etc.)?
- How likely is it that the tumor can be removed (or destroyed) completely?
- Will treatment relieve any of the symptoms I now have?
- What are the possible risks or side effects of treatment? What disabilities might I develop?
- What should I do to be ready for treatment?
- How long will treatment take? What will it be like? Where will it be given?
- What is my expected prognosis (outlook)?
- If I'm concerned about costs and insurance coverage for my diagnosis and treatment, who can help me?

During treatment

Once treatment begins, you'll need to know what to expect and what to look for. Not all of these questions might apply to you, but getting answers to the ones that do may be helpful.

- How will we know if the treatment is working (or has worked)?
- Is there anything I can do to help [manage side effects](#)⁵?
- What symptoms or side effects should I tell you about right away?
- How can I reach you or someone from your office on nights, holidays, or weekends?
- Are there any limits on what I can do?
- Can you suggest a mental health professional I can see if I start to feel overwhelmed, depressed, or distressed?

1. www.cancer.org/cancer/types/brain-spinal-cord-tumors-adults/about/types-of-brain-tumors.html
2. www.cancer.org/cancer/types/brain-spinal-cord-tumors-adults/treating.html
3. www.cancer.org/cancer/managing-cancer/finding-care/seeking-a-second-opinion.html
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