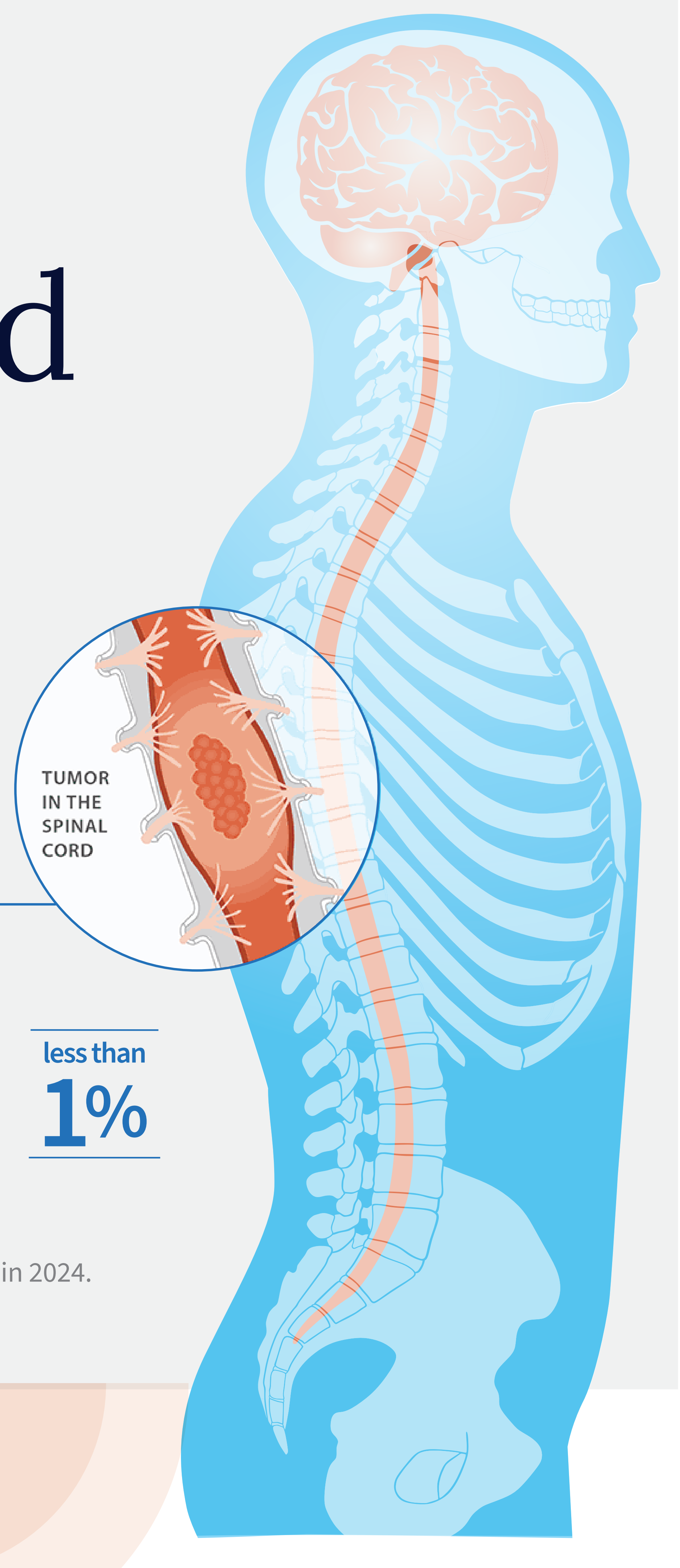
City of Hope®

WHAT YOU SHOULD KNOW ABOUT

Brain & Spinal Cord Tumors



Brain and spinal cord tumors are **rare**.
Unlike some other tumors, these are **considered harmful and require treatment**, even if they are benign, because they may grow and press on nearby areas of the brain.

Facts About Incidence

Men are at **HIGHER RISK** than women.

1 in 140 >> **1 in 190**

The **AVERAGE RISK** of developing a malignant brain or spinal cord tumor is **less than 1%**

An estimated **14,420 men** and in the United States will be diagnosed with a malignant brain or spinal cord tumor in 2024.

Risk Factors

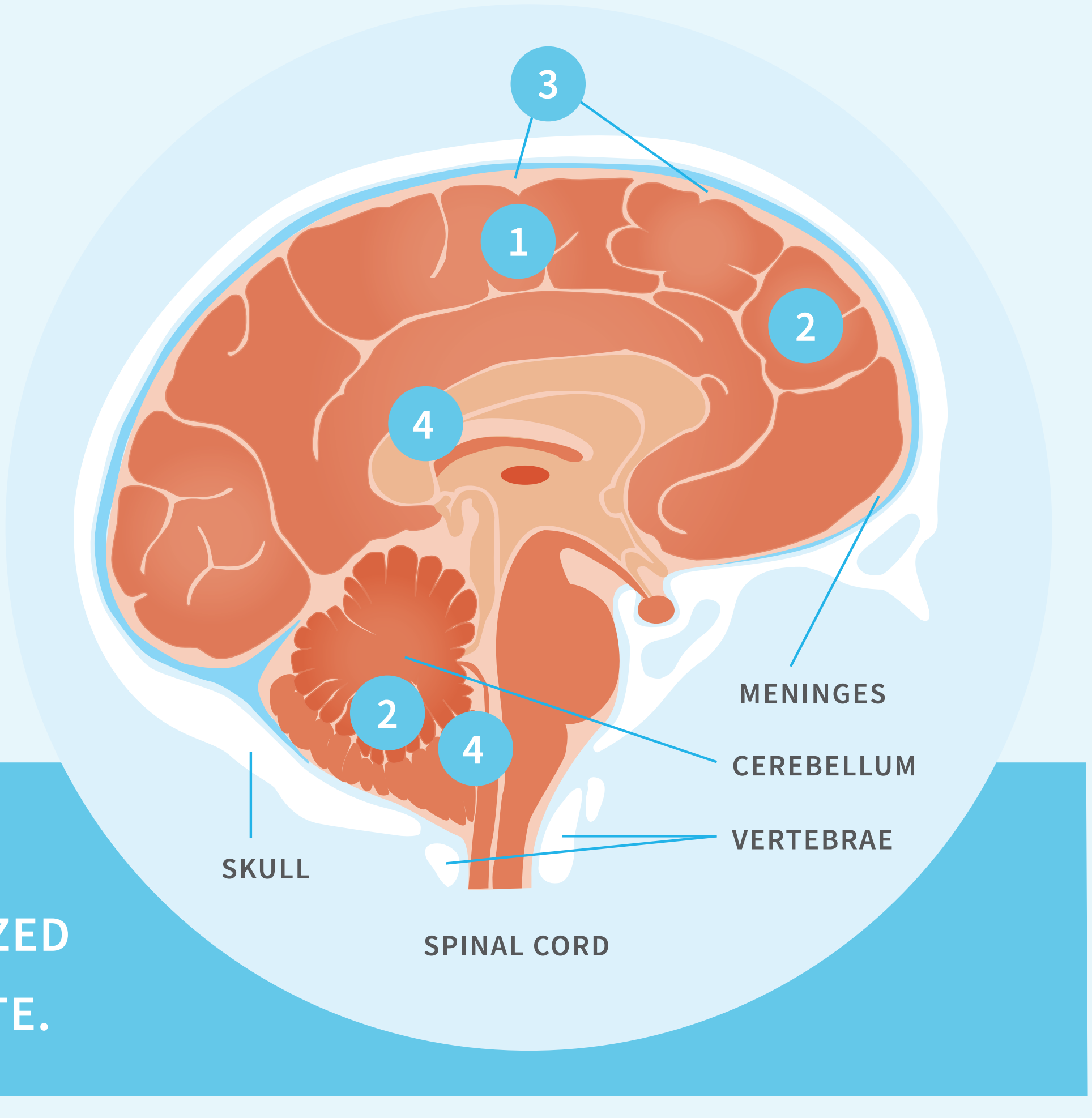
RADIATION
Most radiation-induced brain tumors are **caused by treatments to the head for past cancers.** These brain tumors usually develop 10 to 15 years after the treatment.

FAMILY HISTORY
In rare cases, brain and spinal cord cancers **run in families.**

WEAKENED IMMUNE SYSTEM
People with **weakened immune systems have an increased risk** of lymphomas of the brain or spinal cord.

Understanding the Disease

Tumors that form in the brain or spinal cord are called **primary tumors**, which are different from tumors that form in other organs, such as the lungs or breasts, and then spread to the brain or spinal cord.



TYPES OF PRIMARY BRAIN AND SPINAL CORD TUMORS ARE CATEGORIZED ACCORDING TO WHERE THEY ORIGINATE.

1 OLIGODENDROGLIOMAS

Most oligodendrogliomas grow into nearby brain tissue and aren't able to be completely removed with surgery.

2% OF BRAIN TUMORS ARE OLIGODENDROGLIOMAS.

2 ASTROCYTOMAS*

The fastest-growing astrocytomas are called glioblastomas, which are the most common malignant brain tumors in adults.

TWO OUT OF 10 BRAIN TUMORS ARE ASTROCYTOMAS.

3 MENINGIOMAS*

Meningiomas are the most common brain tumors in adults. They begin in the outer layers of tissue surrounding the brain and spinal cord.

MENINGIOMAS OCCUR TWICE AS OFTEN IN WOMEN AS IN MEN.

4 EPENDYMOMAS*

Some ependymomas may be completely removed with surgery.

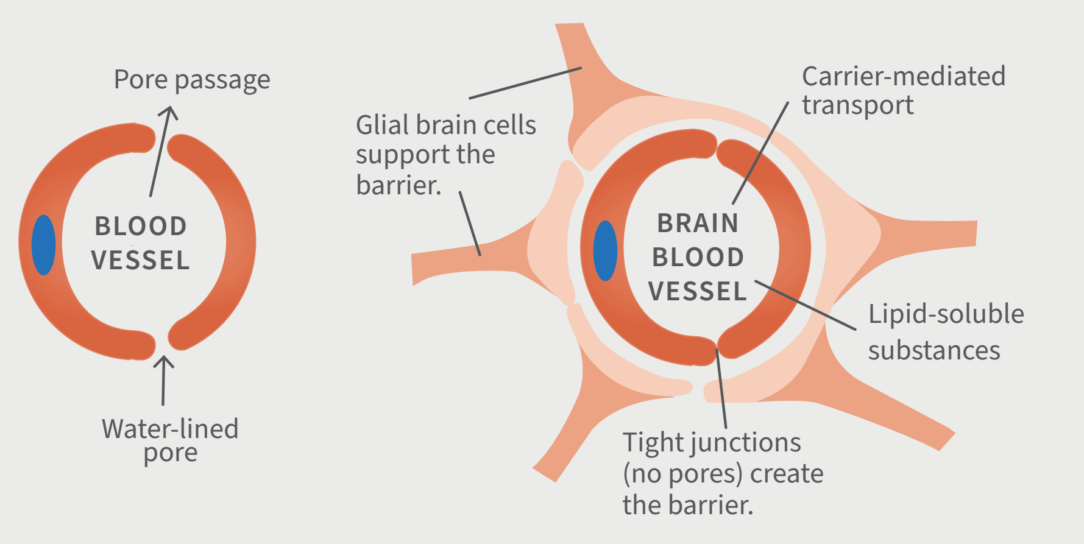
2% OF BRAIN TUMORS ARE EPENDYMOMAS.

*Occur in multiple locations

Treatment Options

Treatment options for brain and spinal cord tumors may depend on a variety of factors, such as the type and size of the tumor and whether it has spread. **The body's blood-brain barrier, which protects the brain and spinal cord from harmful chemicals in the blood, may make treating brain and spinal cord tumors difficult because it also blocks many types of chemotherapy.** Surgery may also be challenging if the tumor is located in or near critical areas of the brain or spinal cord.

NORMAL BLOOD VESSELS VS. BRAIN BLOOD VESSELS



SIGNS & SYMPTOMS

Signs and symptoms of brain or spinal cord tumors may occur gradually and become worse over time, or they may happen suddenly, as with a seizure. Signs include:

- A HEADACHE THAT WORSENS OVER TIME
- NAUSEA
- VOMITING
- SEIZURES
- DROWSINESS
- BLURRED VISION
- BALANCE PROBLEMS
- PERSONALITY OR BEHAVIORAL CHANGES

Treatments may include **surgery**, **radiation therapy**, **chemotherapy** and/or **targeted therapy**, or a **combination of two or more** of these.

SURGERY

For tumors that are slow-growing and haven't spread into nearby tissues, surgery may be the only treatment recommended. For tumors that are fast-growing and have spread, treatment may include surgery, followed by radiation therapy and chemotherapy.

Recent surgical advances for brain tumors include cortical mapping, which allows doctors to identify areas of the brain that control specific functions. For example, if a tumor is located near the brain's speech center, surgeons may perform the operation while the patient is awake so that the patient can provide feedback while electrical stimulation techniques are used to locate the part of the brain that controls speech.

RADIATION THERAPY

Radiation therapy is often used to treat brain and spinal cord tumors after surgery. It may be used in combination with chemotherapy. Radiation therapy techniques may include:

Conformal protein beam radiation therapy delivers proton beams instead of X-rays to a tumor and may be used to treat certain types of brain tumors that have clear edges.

Stereotactic radiosurgery or stereotactic radiotherapy delivers a large dose of radiation to a precise area in one or a few sessions and may be used to treat some tumors that can't be surgically removed.

Cranial spinal radiation delivers radiation to the entire brain and spinal cord and may be used on tumors that have spread to the meninges or into the cerebrospinal fluid.

TARGETED THERAPY

The targeted therapy drug bevacizumab (Avastin®) may be used to treat some types of gliomas that recur after other treatments. Bevacizumab may help shrink some tumors or delay their growth by depriving them of the blood vessels they need to grow.

Another targeted therapy drug, everolimus (Afinitor®, Zortress®), helps stop tumor cells from growing and dividing. This drug may be used to treat some types of astrocytomas that can't be completely removed with surgery.

ALTERNATING ELECTRIC FIELD THERAPY

This type of treatment may be an option for patients with a newly diagnosed glioblastoma, or for patients whose recurrent glioblastoma is fast-growing. Alternating electric field therapy uses a noninvasive portable device to interfere with cell parts that are needed for growth and division.

CHEMOTHERAPY

Chemotherapy, typically used to treat fast-growing tumors, is most often used in combination with other treatments, such as surgery and radiation therapy. Some types of tumors, such as medulloblastomas, respond to chemotherapy better than others.

Because of the blood-brain barrier, many chemotherapy drugs are unable to penetrate the brain. In some cases, the drugs are delivered into the cerebrospinal fluid via a thin tube known as a ventricular access catheter, which is inserted through a small hole in the skull.

Most spinal cord tumors are not treated with chemotherapy because it has not yielded the results other therapies have.

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SOURCES
cancer.gov, cancer.net, cancer.org

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