

## What Is Glioblastoma?

### Glioblastoma is the most common malignant brain tumor in adults.

Glioblastoma is an incurable brain tumor that is diagnosed in more than 13 000 people per year in the US. From the time of diagnosis, the average survival time for people with glioblastoma is approximately 15 months, although about 7% of patients survive to 5 years.

#### Risk Factors and Symptoms of Glioblastoma

The incidence of glioblastoma increases around age 40 years and peaks at approximately age 80 years. Glioblastoma is slightly more common in men than in women. Non-Hispanic White people have the highest rates of glioblastoma.

Headache is the most common symptom of glioblastoma. Depending on its location in the brain, glioblastoma can cause seizures; changes in thinking, behavior, and mood; difficulty with communication; weakness; numbness; or imbalance. Some people may have nausea, vomiting, and fatigue. Symptoms of glioblastoma may begin suddenly or develop slowly over time.

#### What Causes Glioblastoma?

The cause of glioblastoma is unknown in most cases. Patients who received radiation therapy to the brain for treatment of a previously diagnosed cancer have an increased risk of developing glioblastoma. There is no clear link between glioblastoma and use of electronic devices or cell phones or exposure to power lines.

#### Diagnosis and Treatment of Glioblastoma

The recommended imaging study to detect glioblastoma is contrast-enhanced magnetic resonance imaging (MRI) of the brain. If a patient cannot get an MRI, computed tomography (CT) with intravenous contrast can be performed. The diagnosis of glioblastoma is made by examination of surgically removed brain tissue.

First-line therapy for glioblastoma is surgical removal of the tumor, although in some cases, complete removal may not be performed to avoid damage to areas of the brain that are important for vision, speech, movement, and thinking. After surgery, patients are recommended to receive radiation to the brain and chemotherapy (temozolomide). Although this treatment prolongs survival, it does not prevent glioblastoma from recurring. Many patients with glioblastoma undergo a second surgery on their tumor and may receive additional chemotherapy. Patients with glioblastoma should consider participating in clinical trials when possible, due to the currently limited number of effective treatments.

Certain medications may help treat symptoms or conditions caused by glioblastoma. Antiseizure drugs are prescribed for patients who develop seizures. Corticosteroids may be used to treat headaches and brain swelling.

**Glioblastoma** is the most common malignant brain tumor in adults, with more than 13 000 patients diagnosed yearly in the US. It is incurable, and the average survival time after diagnosis is 15 months, with 7% of patients surviving to 5 years.

#### Symptoms of glioblastoma


- Headaches
- Seizures
- Changes in thinking, behavior, and mood
- Difficulty with communication
- Body weakness, numbness, or imbalance

#### Diagnosis of glioblastoma

- Initial tumor detection on brain imaging with magnetic resonance imaging (MRI) or computed tomography (CT)
- Diagnosis confirmation with examination of surgically removed brain tissue

#### Treatment of glioblastoma

- Multidisciplinary approach including specialists in neurosurgery, neuro-oncology, neurology, rehabilitation, and palliative care
- Surgical removal (complete removal may not be possible based on tumor location)
- Radiation and chemotherapy following surgery
- Medications to treat symptoms such as seizures, headaches, and brain swelling

 Treatment of glioblastoma should focus on maximizing quality of life and include discussions about end-of-life care plans.

Patients with glioblastoma should be treated by a multidisciplinary team, including specialists in neurosurgery, neuro-oncology, neurology, rehabilitation, and palliative care. Because glioblastoma is incurable, treatments should focus on maximizing quality of life. It is also important for patients to discuss end-of-life care plans with family members and clinicians.

#### FOR MORE INFORMATION

National Center for Advancing Translational Sciences  
[rarediseases.info.nih.gov/diseases/2491/glioblastoma](https://rarediseases.info.nih.gov/diseases/2491/glioblastoma)

**Author:** Revital Marcus, MD

**Published Online:** March 24, 2023. doi:10.1001/jama.2023.2234

**Author Affiliation:** Fishbein Fellow, JAMA.

**Conflict of Interest Disclosures:** None reported.

**Source:** Schaff LR, Mellinghoff IK. Glioblastoma and other primary brain malignancies in adults: a review. *JAMA*. 2023;329(7):574-587. doi:10.1001/jama.2023.0023

The JAMA Patient Page is a public service of JAMA. The information and recommendations appearing on this page are appropriate in most instances, but they are not a substitute for medical diagnosis. For specific information concerning your personal medical condition, JAMA suggests that you consult your physician. This page may be downloaded or photocopied noncommercially by physicians and other health care professionals to share with patients. To purchase bulk reprints, email [reprints@jamanetwork.com](mailto:reprints@jamanetwork.com).