CONDITION

Glioblastoma multiforme

Glioblastoma is a fast-growing brain tumor that can affect thinking, movement, speech, and other brain functions.

WHAT IT IS
Fast-growing primary brain tumor arising from glial cells

BODY SYSTEM
Nervous system

MAIN SYMPTOMS
Headaches, seizures, weakness, thinking or personality changes

WHAT CAUSES IT
Usually unknown, with acquired cell DNA changes

HOW IT IS DIAGNOSED
MRI, surgery or biopsy, and tumor molecular testing

MAIN TREATMENT
Surgery, radiotherapy, and anti-cancer medicines

CAN IT BE CURED?
No, it usually returns despite treatment

IS IT AN EMERGENCY?
Sometimes, with seizures, sudden weakness, or reduced consciousness

LONG-TERM OUTLOOK
Life-limiting, with survival differing by tumor and person

Overview

Glioblastoma multiforme is now usually called glioblastoma . It is a fast-growing cancer that begins in the brain and develops from cells related to glial cells, which support and protect nerve cells.

Glioblastoma is a grade 4 tumor, meaning its cells grow and spread into nearby brain tissue quickly. It is a primary brain tumor because it starts in the brain rather than spreading there from elsewhere.

The current medical definition usually refers to an adult-type tumor called glioblastoma, IDH-wildtype . IDH is a gene tested in tumor tissue. A grade 4 tumor with an IDH mutation is now classified separately as an astrocytoma, although older records may call it glioblastoma.

Glioblastoma rarely spreads outside the brain and spinal cord. However, growth within the brain can affect movement, speech, memory, behavior, vision, and other functions. Treatment can slow its growth, ease symptoms, and help preserve independence, but it is not currently curable.

Symptoms

Symptoms depend on the tumor's location and size and how quickly pressure builds within the skull. They may develop over days or weeks, although some appear more gradually.

Possible symptoms include:

These symptoms have many possible causes and do not necessarily mean you have glioblastoma. New neurological symptoms involving the brain or nerves still need prompt medical assessment.

- New or worsening headaches, sometimes worse in the morning
- A first seizure or a change in an existing seizure pattern
- Weakness, numbness, or poor coordination, often on one side
- Problems speaking, understanding words, reading, or writing
- Changes in memory, concentration, judgment, or personality
- Blurred or double vision
- Nausea, vomiting, unusual sleepiness, or reduced alertness

Causes and risk factors

Glioblastoma develops when genetic changes cause certain brain cells to grow without normal control. These changes are usually acquired during life rather than inherited from a parent.

In most people, there is no clear reason why the tumor formed. It is not thought to result from injury, stress, diet, or something the person did.

Exposure to ionizing radiation to the head is an established but uncommon risk factor. This can include previous radiotherapy for another tumor. The benefits of medically necessary scans or radiotherapy are considered alongside their radiation risks.

A small number of gliomas occur in people with inherited cancer-risk conditions, including Li-Fraumeni syndrome, Lynch syndrome, and neurofibromatosis type 1. Most people with glioblastoma do not have one of these syndromes or a family history of brain tumors.

Current evidence has not established ordinary mobile phone use as a cause of glioblastoma.

Diagnosis

Assessment usually begins with questions about symptoms and a neurological examination of functions such as strength, balance, reflexes, vision, speech, and memory.

Magnetic resonance imaging, or MRI , is the main scan used to assess a suspected brain tumor. Contrast is often injected into a vein to make abnormal areas easier to see. A computed tomography, or CT , scan may be used when urgent imaging is needed or MRI cannot be performed.

A scan can strongly suggest glioblastoma but cannot confirm the exact tumor type. Confirmation usually requires tissue removed during surgery or a biopsy. A biopsy takes a small sample, often using image guidance when removing the tumor would be unsafe.

A pathologist examines the cells, and molecular testing helps classify the tumor. Important tests include IDH status and changes involving the TERT promoter, chromosomes 7 and 10, or the EGFR gene.

Testing may also assess MGMT promoter methylation , a chemical change affecting how a tumor repairs DNA damage. It can help estimate the likely benefit from temozolomide, especially when treatment decisions must account for age or general health.

Treatment and management

Treatment is planned by a specialist team and reflects the tumor's location, molecular findings, your overall health, and what matters to you.

Surgery is often the first treatment when the tumor can be reached safely. The aim is to remove as much visible tumor as possible without causing unacceptable loss of brain function. Complete removal is usually impossible because tumor cells extend into nearby tissue beyond what scans show.

If a large operation is unsafe, a biopsy may confirm the diagnosis before other treatment. Some operations use brain mapping or an awake technique to protect speech and movement.

For many adults who are well enough, surgery is followed by radiotherapy combined with temozolomide, an anti-cancer medicine. Temozolomide may continue after radiotherapy. Treatment may be adjusted for older adults, people with serious health conditions, or those who would find combined treatment too burdensome.

Tumor treating fields may be offered in some settings after radiotherapy. Adhesive arrays on the shaved scalp deliver low-intensity alternating electrical fields. The device must be worn for much of each day and can irritate the skin.

Other treatments manage symptoms and daily function. Steroids such as dexamethasone reduce swelling around the tumor, while anti-seizure medicines are used for people who have seizures. Physiotherapy, occupational therapy, speech therapy, and psychological support may help with movement, communication, thinking, or home adaptations.

Glioblastoma commonly grows again. Options at recurrence may include another operation, focused radiotherapy, medicines, tumor treating fields, or a clinical trial. Bevacizumab can reduce swelling and delay worsening on scans for some people, but it does not cure the tumor.

Palliative care is appropriate from diagnosis alongside tumor treatment. It supports symptom control, emotional wellbeing, family needs, and planning ahead. It is not limited to the final stage of life.

Complications

The tumor and surrounding swelling can cause seizures, weakness, speech problems, confusion, or increasing sleepiness. Symptoms may change as the tumor grows or responds to treatment.

Surgery can cause bleeding, infection, seizures, blood clots, or new neurological difficulties. Risks depend greatly on the tumor's location.

Radiotherapy can cause tiredness, scalp irritation, and hair loss in the treated area. Later effects may include memory or thinking changes. Temozolomide can lower blood cell counts, increasing the risk of infection, bruising, or anemia. It may also cause nausea and fatigue.

Reduced mobility can increase the risk of blood clots, pressure injuries, and muscle loss. Swallowing problems can cause poor nutrition or allow food and liquid to enter the lungs. Rehabilitation and practical support can reduce some effects.

Prevention

There is no proven way to prevent most glioblastomas. The genetic changes usually occur without an identifiable or avoidable cause.

People who received radiation to the head still have only an uncommon risk of developing a later brain tumor. Necessary medical imaging and radiotherapy should not be avoided without

discussing their purpose and possible alternatives.

Routine screening is not recommended without symptoms or a known high-risk inherited syndrome. If several close relatives have had related cancers, genetic counseling may help determine whether testing is appropriate and guide monitoring for some conditions.

Living with it and what to expect

Glioblastoma is life-limiting, and most tumors return after initial treatment. No test can predict one person's exact course. Outlook is influenced by age, general health, tumor location, molecular features, the amount safely removed, and response to treatment.

During initial treatment, hospital visits and fatigue can take up much of daily life. Some symptoms improve when surgery or steroids like prednisone or hydrocortisone reduce pressure in the brain. Weakness, speech difficulty, or thinking changes may continue and require rehabilitation or support.

Follow-up usually includes regular appointments, neurological checks, and MRI scans. Treatment can produce swelling or contrast changes that resemble tumor growth. The team may compare several scans, repeat imaging, or use additional tests before deciding that treatment has stopped working.

Support needs may increase over time. Some people remain active and independent for a substantial period, while others need earlier help with transport, medicines, meals, finances, or personal care. Judgment or personality changes can be difficult for families because the person may not fully notice them.

It can help to discuss work, driving, finances, legal documents, and future care preferences while you can participate fully. Driving rules usually require reporting a brain tumor or seizure to the relevant licensing authority, although requirements vary by location.

Caregivers also need information and practical support. Respite care, counseling, social work, and brain tumor support organizations may help. Decisions can be reviewed as symptoms, scans, and personal priorities change.

When to get medical help

Contact your treatment team promptly about new or worsening headaches, repeated vomiting, increasing confusion, new weakness, speech or vision changes, worsening balance, or a seizure when you have an agreed seizure plan.

Seek emergency help for:

Use routine follow-up to discuss treatment side effects, gradual changes in memory or independence, scan results, rehabilitation needs, and future care planning. Do not wait for a routine appointment if symptoms change quickly.

- A first seizure
- A seizure lasting longer than directed in your emergency plan
- Repeated seizures without normal recovery between them
- Sudden weakness, facial drooping, or difficulty speaking
- Severe breathing difficulty or inability to wake normally
- A sudden, severe headache with collapse or loss of consciousness

Common questions

Is glioblastoma the same as brain cancer?

Glioblastoma is one type of brain cancer. It begins in the brain and differs from cancers that start elsewhere and spread there.

Can glioblastoma be completely removed with surgery?

A surgeon may remove all visible tumor, but microscopic cells usually remain in nearby brain tissue. This is why radiotherapy and anti-cancer medicine are often recommended after surgery.

Is glioblastoma curable?

It is not currently considered curable. Treatment may control it for a period, ease symptoms, and extend life, but the tumor usually grows again.

Is glioblastoma inherited?

Usually not. Most cases result from genetic changes acquired only in tumor cells. A small minority are linked to inherited cancer syndromes.

Can a glioblastoma suddenly get worse?

Symptoms can worsen quickly because of tumor growth, brain swelling, bleeding, or seizures. Sudden weakness, reduced consciousness, or a first seizure needs emergency assessment.

Can someone live independently with glioblastoma?

Some people remain independent during and after initial treatment. Others need support because of fatigue, seizures, weakness, or thinking changes. Needs may increase over time,

but the timing cannot be predicted.

Sources

- National Cancer Institute. Adult Central Nervous System Tumors Treatment (PDQ®)-Patient Version . National Institutes of Health
- National Institute for Health and Care Excellence. Brain tumours (primary) and brain metastases in over 16s . NICE guideline NG99, 2018, updated 2021
- WHO Classification of Tumours Editorial Board. Central Nervous System Tumours . WHO Classification of Tumours, 5th edition, volume 6. International Agency for Research on Cancer, 2021
- Weller M, van den Bent M, Preusser M, and colleagues. "EANO guidelines on the diagnosis and treatment of diffuse gliomas of adulthood." Nature Reviews Clinical Oncology . 2021;18:170-186
- Wen PY, Weller M, Lee EQ, and colleagues. "Glioblastoma in adults: a Society for Neuro-Oncology and European Society of Neuro-Oncology consensus review on current management and future directions." Neuro-Oncology . 2020;22:1073-1113
- Stupp R, Mason WP, van den Bent MJ, and colleagues. "Radiotherapy plus concomitant and adjuvant temozolomide for glioblastoma." New England Journal of Medicine . 2005;352:987-996