

Information Sheet 4: High-Grade Glioma brain tumours and treatment options

This information document on high grade brain tumours simply provides a basis for discussion with the healthcare professionals with whom you are in contact. It should not in any way be used as a substitute for professional care.

What is a Glioma?

There are nearly 100 different types of brain tumours. Most primary brain tumours develop from the cells that support the nerve cells of the brain. These are called glial cells. So a tumour of glial cells is given the collective name of a **glioma**. About half of all primary brain tumours are gliomas.

Low-grade or high-grade?

Brain tumours are put into groups according to how fast they are likely to grow. There are four groups, called **Grades 1–4**. The cells are examined under a microscope, and the more normal they look, the more slowly the brain tumour is likely to develop and the lower the grade. The more *abnormal* the cells look, the more quickly the brain tumour is likely to grow and the higher the grade.

You may have been told you have a benign tumour or a malignant tumour. Low-grade tumours are generally regarded as benign and high-grade as malignant.

Malignant

So, generally speaking, **malignant** means that:

- The tumour is relatively fast growing
- It may come back after surgery, even if completely removed
- It may spread to other parts of the brain or spinal cord
- It cannot just be treated with surgery and will need further treatments, such as radiotherapy or chemotherapy, to try to stop it from returning.

Types of glioma

Gliomas can be separated further, depending on the cells they developed from.

- An **ependymoma** develops from the **ependymal cells**, which line the cavities in the brain. They can be high-grade or low-grade.
- An **oligodendroglioma** will have developed from oligodendrocytes, which help as insulators in the transmission of messages in the brain. Oligodendrogliomas are most commonly found in the forebrain, that is in the temporal or frontal lobes. The tumour can spread within the central system, in the fluid that circulates round the brain and spinal cord.
- An **astrocytoma** will have developed from astrocytes, thought to provide the brain's framework and help control the chemistry of brain cells. The World Health

Organisation grades astrocytomas into four grades, with Grades 1 and 2 being less malignant and Grades 3 and 4 being the most malignant, as we indicated above.

- A Grade 3 astrocytoma is also known as an **anaplastic astrocytoma**. A Grade 4 astrocytoma is also known as a **glioblastoma multiforme** (shortened to GBM4). These are malignant tumours and can sometimes spread to other parts of the brain.

What are the common symptoms?

The symptoms will vary with each individual and depending on the size and location of the tumour. Some people may experience all, some or none of the symptoms. The first of these may be a headache (due to increased pressure in the head), seizures or weakness, numbness or speech problems.

How is a diagnosis made?

Investigation of a suspected brain tumour follows a standardised procedure. A good neurological examination is essential, followed by some combination of the following tests, depending on the need and availability.

- **CT** (Computed Tomography) **brain scan** is a specialised x-ray. It will take 20-30 minutes. An injection into the back of your hand of a dye to act as a contrast may be given to obtain the clearest picture of the tumour.
- **MRI** (Magnetic Resonance Imaging) **brain scan** is a specialised imaging technique that gives very clear pictures of the brain and will show the site and extent of the tumour. It usually takes 30 to 40 minutes and uses magnetism instead of x-rays. People with pacemakers cannot have this test and those with any other metallic implant should inform the medical team well before the test.

How common are these tumours and who gets them?

Unfortunately the cause of High Grade Gliomas remains unknown. There do not appear to be any links with occupation, infections or head injury and research has not proved a hereditary link. Organisations like Brain Tumour UK, and others in the voluntary sector, are working tirelessly to fund research projects to try and find a cure for this devastating condition. Separate information on the research projects funded by Brain Tumour UK can be seen on our website at www.braintumouruk.org.uk.

Around eight new cases of primary brain tumours are diagnosed for every 100,000 people each year – in other words about 4,500 new cases in the UK annually. About 70% to 80% of primary brain tumours are High Grade Gliomas. They occur most often between the ages of 46 and 50, affecting men more often than women.

What treatment might be available?

Your medical team will plan your treatment taking in to consideration your general health, your symptoms and the size and position of the tumour. It depends on the individual.

The first treatment choice for accessible tumours is surgery. Accessible tumours are those that can be operated on without a high risk of causing severe neurological damage. High Grade Gliomas may occur in sites that are not easily reached in surgery. In these instances, biopsy alone – where a surgical sample of the tumour is taken – may be performed. Biopsy results help to establish the diagnosis and indicate whether

the tumour is amenable to other treatments. Tumours that are located in the areas of the brain that control breathing, intellect or physical movement might possibly be considered inoperable.

Radiotherapy

Radiotherapy is the use of high energy x-rays to destroy tumour cells. It is often given after surgery and may be used alone or given with chemotherapy. For more detailed information on radiotherapy, we can send you a booklet, produced in association with Brain Tumour Action, on this subject.

Chemotherapy

Chemotherapy is treatment with drugs which destroy tumour cells. It may be given alone or with surgery and/or radiotherapy. For more detailed information on chemotherapy, we can send you our information sheet on this subject.

Temozolomide

Temozolomide (known as Temodal) cannot cure a brain tumour, but may extend survival and improve the quality of life of the patient. It is type of drug known as an alkylating agent and it works by stopping cancer cells from making new DNA. If they cannot make DNA, they cannot split into two new cancer cells. For newly diagnosed high-grade glioma patients, the drug (in capsule form) may be given at the same time as radiotherapy and for a period thereafter. Concomitant radiotherapy and temozolomide for newly diagnosed high grade glioma is nowadays standard treatment in the UK and other countries.

In June 2007 the UK evaluation agency, the National Institute for Health and Clinical Excellence (NICE) issued recommendations for newly-diagnosed glioma patients as follows. Temozolomide, within its licensed indications, is recommended for the treatment of newly diagnosed glioma in patients with a World Health Organisation performance status of 0 or 1. Carmustine implants are recommended as a possible treatment for people with a newly diagnosed high grade glioma only if 90% or more of their tumour has been removed.

If you would like further information or support please contact us at Brain Tumour UK, Tower House, Latimer Park, Chesham, Bucks. HP5 3AP or call our Helpline **0845 450 0386**. Alternatively you can email us at helpline@braintumouruk.org.uk.