



AMERICAN ASSOCIATION OF  
NEUROLOGICAL SURGEONS

## NATIONAL NEUROSURGERY AWARENESS WEEK

# Brain Tumor Facts

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A brain tumor is an abnormal mass of tissue in which cells grow and multiply uncontrollably, seemingly unchecked by the mechanisms that control normal cells. Brain tumors can be primary or metastatic, and either malignant or benign. A metastatic brain tumor is a cancer that has spread from elsewhere in the body to the brain. Brain tumors are classified into two main groups: gliomas, composed of supporting cells that invade the neural tissue surrounding them; and nonglial tumors which compress, rather than invade, neighboring brain tissue as they grow. It is estimated that in 2000, more than 359,000 persons were living with a diagnosis of a primary brain tumor in the United States. In 2005, it is estimated that nearly 12,800 deaths will be associated with malignant tumors of the brain and other parts of the central nervous system. Fortunately, new and sophisticated techniques have led to advances in the treatment of brain tumors. Tumors that were once inoperable in the brain stem or thalamus can now be accessed and removed, sometimes completely, and often without impaired neurological function.

## Causes

It is thought that brain tumors occur when certain genes on the chromosomes of a cell are damaged so that they no longer function properly. In some cases, an individual may be born with partial defects in one or more of these genes.

Environmental factors may then lead to further damage. In other patients, the environmental injury to the genes may be the only cause. It is not known why some people in an "environment" develop brain tumors while others do not. While there has been research into the connection between cell phone usage and brain tumors, the findings to date have been inconclusive.

## Symptoms

- Persistent headaches
- Double or blurred vision
- Vomiting
- Loss of appetite
- Changes in mood and personality
- Changes in ability to think and learn
- New seizures
- Speech difficulty of gradual onset

Brain and nervous system tumors account for 21 percent of all childhood cancers. In early stages, children may experience headaches, nausea, vomiting, blurred or double vision, dizziness, and changes in coordination.

## Diagnosis

Sophisticated imaging techniques can pinpoint the tumor and determine whether it's growing or

shrinking. Diagnostic tools include computed tomography (CT or CAT scan) and magnetic resonance imaging (MRI). MRI is also used during surgery to guide tissue biopsies and tumor removal. Magnetic resonance spectroscopy (MRS) is used to examine the tumor's chemical profile and see whether the tumor is responding to treatment. Positron emission tomography (PET scan) can help detect recurring brain tumors.

## Treatment

Surgery is the main form of treatment for brain tumors that lie within the membranes covering the brain or in parts of the brain that can be removed without damaging critical neurological functions. The goal is to remove the entire tumor, whenever possible, as a tumor may recur if any tumor cells are left behind. Radiation therapy and chemotherapy are generally used as secondary treatment for tumors that cannot be cured through surgery alone.

**Stereotactic radiosurgery** is a treatment option that delivers a high concentration of radiation directly to the tumor in order to stop its growth, while delivering only a minimal dose of radiation to the surrounding tissue. Unlike conventional surgery, stereotactic radiosurgery does not require making an incision to remove the tumor. It can be especially effective in patients with many small metastatic brain tumors.

For more detailed information, visit  
[www.NeurosurgeryToday.org](http://www.NeurosurgeryToday.org).