

Redwood Caregiver Resource Center  
1140 Sonoma Ave., Ste. 1B  
Santa Rosa, CA 95405  
(707) 542-0282 or (800) 834-1636  
Fax (707) 542-0552

Email: [rcrc@redwoodcrc.org](mailto:rcrc@redwoodcrc.org)

Web: <http://redwoodcrc.org>

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# Fact Sheet Brain Tumor

## Definition

A tumor is an abnormal mass of tissue which results from the excessive multiplication of cells. A tumor that originates in the brain is called a "primary" brain tumor. Primary brain tumors may be either benign or malignant. These tumors very rarely, if ever, metastasize (spread to other parts of the body). Metastatic brain tumors begin as a cancer elsewhere in the body then spread to the brain.

## Facts

According to the North American Brain Tumor Coalition, the estimated number of new cases of primary brain tumors diagnosed each year is approximately 40,000. Some research indicates that the number of primary brain tumors are rising, particularly in the elderly. Primary malignant brain tumors represent 2.4 percent of all deaths due to cancer in the U.S. However, nearly half of all primary brain tumors are benign and can be successfully treated.

An additional 150-200,000 individuals are diagnosed with metastatic brain tumors. Metastatic brain tumors appear to be increasing due largely to the improvements in treating systemic cancer. This is because following treatment for systematic cancer, stray cancer cells can find their way to the brain.

Brain tumors are usually classified by cell types. Certain types of primary brain tumors most commonly occur in children while others occur more frequently in adults. Adult brain tumors have their highest incidence between the ages of 40 and 60 years, with a slight preponderance in men.

## Symptoms

Symptoms may vary by type and location of the brain tumor. They can include: severe headaches, seizures, visual disturbances, motor weakness, sensory disturbances, language disorders, short term memory loss, personality changes, mood swings, intellectual impairment, and endocrinological disturbances.

## Diagnosis

Diagnosis of a brain tumor occasionally is difficult because symptoms may be similar to those caused by other disorders. Making the diagnosis of a brain tumor has been greatly simplified by the advent of CT scans and MRI scanning. Occasionally other techniques like an arteriogram (shows the blood vessels in the brain) or sometimes an electroencephalogram (measures the electrical activity of the brain) may be used in order to obtain more information about a lesion seen on a CT or MRI scan. Depending on tumor location and other factors, it may be important to analyze cerebrospinal fluid, obtained by a procedure called a lumbar puncture. This procedure, however, is usually avoided if there is any evidence of increased pressure in the brain.

## Treatment

Various forms of treatment are available and are discussed below.

## Surgery

The first treatment of choice, depending on the location and size of the lesion, is surgical removal of as much of the lesion as possible. If a total or partial resection is not in the patient's best interest, a biopsy should be performed, to obtain tissue (cell) diagno-

sis, before proceeding with other forms of therapy. The removed tissue is analyzed in a pathology lab, and the diagnosis is made. The need for additional treatment depends upon the tumor type and the amount of tumor that was successfully removed.

Surgery side effects should be discussed with the surgeon before the operation. Results vary, and side effects are often temporary, but may be permanent. Side effects of surgery include the risks of infection, blood clotting, seizures and, in some cases, increased neurological deficit that may be temporary or permanent.

## **Radiation Therapy**

Conventional radiation therapy uses external beams of either x or gamma rays aimed at the tumor. The therapy is given over a period of several weeks.

Other types of radiation also are available. One of these is interstitial radiation—implanting radioactive seeds directly into a tumor. Another form of radiation, called radiosurgery, delivers a high, single dose of radiation to a small, well-defined target. Another technique is photodynamic therapy. The machines are called x-knife (using the modified Linear Accelerator) or the gamma knife. A light sensitive drug is given through a vein and concentrates in the tumor. Then, during a surgical procedure, a special light activates the drug. Also available are other forms of radiation energy, dosages, and schedules.

Side effects of radiation therapy may include hair loss, skin irritation, fatigue and, rarely, increase of pre-existing neurologic deficits. Side effects of radiation differ depending on many factors. These should be discussed with the radiation therapist.

## **Chemotherapy**

Certain chemotherapeutic drugs have proven to be effective in controlling the growth of a tumor for shorter or longer periods of time. Thanks to ongoing research, there are a number of new drugs, drugs in combinations, and treatment and modalities available to treat primary brain tumors.

Side effects of chemotherapeutic drugs include nausea or vomiting, disruption of the production of blood cells in the bone marrow, occasionally soreness of the mouth or mouth ulcers and skin rash.

These side effects are usually reversible and may vary with each individual.

In 1996 the U.S. Food and Drug Administration (FDA) approved the Gliadel Wafer for use as an adjunct to surgery to prolong survival in patients with glioblastoma multiforme. This specifically worded FDA approval is for use in "patients with recurrent glioblastoma for whom surgery is otherwise indicated." This new chemotherapy technology delivers chemotherapy directly to the tumor site. Up to eight wafers are implanted into the site after the brain tumor has been removed. The wafers slowly erode, delivering the treatment over 2-3 weeks. Studies have indicated a 50 percent higher survival rate at six months for patients using Gliadel wafers.

## **Immunotherapy**

This is a form of therapy aimed at activating the patient's own immune system in order to kill tumor cells. This group of substances includes the interferons, interleukins, growth factors and others. These forms of therapy are experimental and available through some treatment centers on clinical protocol.

## **Medications**

There are several groups of medications that one may need during and after treatment of a brain tumor. These include anticonvulsants to prevent seizures, and steroids, such as prednisone and dexamethasone, used throughout the treatment to reduce the swelling around the tumor.

Each physician has a preference of specific drugs and will explain why these medications are needed, even if only needed for a short period of time. Have the physician, nurse or your pharmacist explain the drug's potential side effects.

Side effects are increased appetite, weight gain, swelling of face and feet, nervousness or restlessness, trouble sleeping, blood sugar and hormonal disturbances, and weakening of bones and muscles.

## **Recommended Readings**

*Navigating Through A Strange Land. A Book For Brain Tumor Patients and Their Families*, Patricia Ann Roloff (Ed), 1995, Indigo Press, 109 Walnut St., San Francisco, CA 94118.

*Coping With a Brain Tumor Part I: From Diagnosis to Treatment and Part II: During and After*

**Treatment**, American Brain Tumor Association, 2720 River Road, Ste. 146, Des Plaines, IL 60018.

**A Primer on Brain Tumors**, Sixth Edition, Gail Segal, 1996, available from the American Brain Tumor Association, 2720 River Road, Ste. 146, Des Plaines, IL 60018.

**Love, Medicine and Miracles**, Bernie Siegel, 1986, Harper Perennial, New York, NY, (800) 242-7737.

Brain Tumors: A Guide, the National Brain Tumor Foundation, 1993, 785 Market St., #1600, San Francisco, CA 94103-2003. Also available:

- SEARCH (Newsletter), National Brain Tumor Foundation
- Support Groups for Brain Tumor Patients and Families, National Brain Tumor Foundation

## Credits

American Brain Tumor Association, 1994, *Coping With A Brain Tumor*, Des Plaines, IL.

American Brain Tumor Association, 1996, *A Primer of Brain Tumors*, Sixth Edition, Des Plaines, IL.

National Brain Tumor Foundation, 1996, FDA Approved Use of New Chemotherapy Technology. *Search*, Fall 1996.

North American Brain Tumor Coalition, 1996.

## Resources

**Family Caregiver Alliance**  
425 Bush Street, Suite 500  
San Francisco, CA 94108  
(415) 434-3388  
(800) 445-8106 (in CA)

**Web Site:** <http://www.caregiver.org>  
**E-mail:** [info@caregiver.org](mailto:info@caregiver.org)

Family Caregiver Alliance supports and assists caregivers of brain-impaired adults through education, research, services and advocacy.

*Reviewed by Sharon Lamb, R.N., President, National Brain Tumor Foundation; and Deneen Hesser, American Brain Tumor Association. Prepared by Family Caregiver Alliance in cooperation with California's Caregiver Resource Centers, a state-wide system of resource centers serving families and caregivers of brain-impaired adults. Funded by the Department of Mental Health. Revised and reprinted January 1997. ©All rights reserved.*

FCA's information Clearinghouse covers current medical, social, public policy and caregiving issues related to brain impairments.

For residents of the greater San Francisco Bay Area, FCA provides direct family support services for caregivers of those with Alzheimer's disease, stroke, head injury, Parkinson's, brain tumor and other debilitating brain disorders that strike adults.

### **Acoustic Neuroma Association**

P.O. Box 12402  
Atlanta, GA 30355  
(404) 237-8023

### **American Brain Tumor Association**

2720 River Road, Suite 146  
Des Plaines, IL 60018  
(847) 827-9910  
(800) 886-2282 (patient hot-line)

### **American Cancer Society**

1599 Clifton Road N.E.  
Atlanta, GA 30329  
(404) 320-3333  
(800) ACS-2345 (cancer information number)

### **National Brain Tumor Foundation**

785 Market Street, #1600  
San Francisco, CA 94103-2003  
(415) 284-0208  
(800) 934-CURE

### **National Cancer Institute**

Building 31, Room 10A24  
Bethesda, MD 20892-3100  
1-800-4-CANCER  
(in Hawaii, call 524-1234)

### **Clinical Trials on the Internet**

<http://www.Ianminds.com/local/brain/trial.html>