

Chapter 3

Facts & Statistics

Brain tumors do not discriminate. Primary brain tumors occur in people of all ages, but they are statistically more frequent in two age groups — children under the age of 15, and older adults. Metastatic brain tumors are much more common in adults.

Spinal cord tumors are less common than brain tumors. Although they affect people of all ages, they occur most frequently in young and middle-aged adults.

The facts and statistics here include brain and spinal cord tumors (central nervous system tumors). We continually update these statistics, as they become available, at our web site: www.abta.org.

Incidence Statistics

An estimated 40,900 new cases of primary brain tumors are expected to be diagnosed in 2004. This is based on an incidence rate of 14 per 100,000 persons¹ and a projected 2004 U.S. population of 285,266,000 (*www.census.gov*).

Incidence is the number of people newly diagnosed in one year. **Rate** is the measure of the amount of a disease in a specific population. It is calculated by counting the number of people with the disease and dividing by the total population at risk.

Why is there a wide variation in the reported incidence of primary brain tumors? Sources that quote the incidence of brain tumors at 18,000+ or 19,000+ people diagnosed per year are based on data counting only malignant brain tumors. The incidence statistics stated above (40,900 persons diagnosed per year) include those with all primary brain tumors, both malignant and benign, and are based on the year 2004 population.

In the United States, approximately 3,140 children younger than age 20 are diagnosed annually with primary brain tumors.

Brain tumors are the most common of the solid tumors in children, and the second most frequent malignancy of childhood.²

Although statistics for brain metastases are not readily available, it is estimated that over 100,000 cancer patients per year will have symptoms due to metastatic brain tumors and up to 80,000 per year will have a metastatic tumor in the spinal cord.³ *Metastatic brain tumors* begin as a cancer elsewhere in the body and spread, or metastasize, to the brain. *Primary brain tumors* are tumors that begin in the brain and tend to stay in the brain.

Regarding Incidence Trends

The incidence of malignant brain tumors appears to be level in nearly every age group except for those 85 years and older for whom use of scanning techniques is still increasing.⁴ Previous reports of an increase in primary brain tumors may be due to improvements in diagnosis and changes in the diagnosis and treatment of the elderly.⁴

Prevalence Statistics

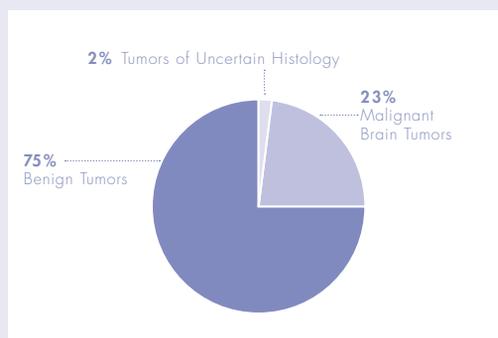
NOTE — these prevalence statistics refer to primary brain tumors only. *Prevalence* is the total number of people now living following the diagnosis of a brain tumor.

It is estimated that, during the year 2000, approximately 359,000 people in the United States were living after the diagnosis of a primary brain tumor.⁵ This is the prevalence for brain tumors, as opposed to the incidence which reflects the number of people newly diagnosed in a given time period. Note: year 2000 prevalence statistics are the most recent available.

For every 100,000 people in the United States, approximately 131 are living following the diagnosis of a brain tumor. This represents a prevalence rate of 130.8 per 100,000 persons.⁵

Of the brain tumor survivors, about 75% were diagnosed with benign tumors. About 23% were diagnosed with malignant tumors, and 2% of the tumors were of uncertain behavior.⁵

BRAIN TUMOR TYPES FOR PEOPLE LIVING WITH A BRAIN TUMOR



The prevalence rate for primary malignant tumor survivors is estimated to be 29.5 per 100,000. The prevalence rate for primary benign tumor survivors is estimated to be 97.5 per 100,000 persons.⁵

Pediatric Statistics

An estimated 3,140 children less than 20 years of age will be diagnosed with a primary benign or malignant brain tumor during the year 2004.

The incidence rate of primary brain tumors in children is 3.9 cases per 100,000 children. The rate is slightly higher in males (4.1 per 100,000) than females (3.8 per 100,000).¹

Brain tumors are the second most frequent malignancy of childhood and the most common of the solid tumors.²

Brain tumors are the second leading cause of cancer-related deaths in children under the age of 20. Leukemia remains the first.^{2,6}

Trends in incidence of primary malignant brain tumors for children in the United States using Surveillance, Epidemiology, and End Results (SEER) Program data and a sophisticated statistical technique were recently evaluated.⁷ SEER is a program of the National Cancer Institute. It collects and analyzes information on cancer incidence, mortality, and survival in the US. SEER data does not include benign brain tumors. The incidence of brain malignancies did not increase steadily from 1973 to 1994 as previously reported, but rather “jumped” to a steady, higher rate after 1984-85. The timing of the “jump” coincided

with the wider availability of magnetic resonance imaging (MRI) in the United States. This finding, combined with the absence of any “jump” in corresponding mortality for the same period, appears due to improved diagnosis and reporting during the 1980s.⁷

Age- and Gender-Specific Statistics

The incidence rate of primary brain tumors is 14.2 per 100,000 for males and 13.9 per 100,000 for females.¹ Rates are age-adjusted to the year 2000 US standard population.

Brain tumors are the:

- leading cause of cancer-related deaths in males ages 20-39⁶
- fifth leading cause of cancer-related deaths in women ages 20-39⁶

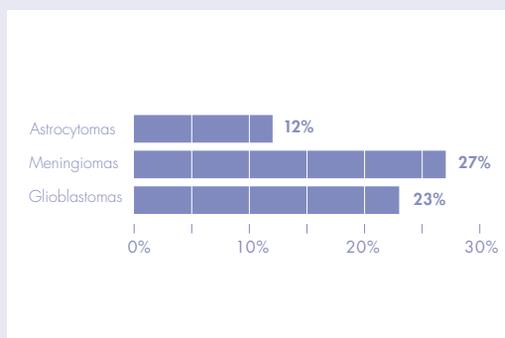
Within the following age groups, the most common primary brain tumors are:

- in ages 0-4, embryonal/primitive neuroectodermal tumors/medulloblastomas
- in ages 5-9, pilocytic astrocytomas
- in ages 10-14, pilocytic astrocytomas
- in ages 15-19, pilocytic astrocytomas
- in ages 20-34, pituitary tumors
- in ages 35-44, meningiomas
- in ages 45-54, meningiomas
- in ages 55-64, glioblastomas
- in ages 65-74, glioblastomas
- in ages 75-84, meningiomas
- in ages 85 and older, meningiomas¹

COMMON PRIMARY BRAIN TUMORS, BY AGE

0-4	5-9	10-14	15-19	20-34	35-44	45-54	55-64	65-74	75-84	85+
Embryonal/Primitive Neuroectodermal Tumors/ Medulloblastomas Ages 0-4				Pituitary Tumors Ages 20-34						
	Pilocytic Astrocytomas Ages 5-19				Meningiomas Ages 35-54					
										Meningiomas Ages 75 and older

TYPES OF PRIMARY BRAIN TUMORS



Tumor-Specific Statistics

Meningiomas represent 27% of all primary brain tumors, making meningiomas the most common primary brain tumor.¹

Glioblastomas represent 23% of all primary brain tumors.¹

Astrocytomas represent 12% of all primary brain tumors.¹

Nerve sheath tumors (such as acoustic neuromas, vestibular schwannomas, neurilemmomas) represent 8% of all primary brain tumors.¹

Pituitary tumors represent 7% of all primary brain tumors.¹

Lymphomas represent 3% of all primary brain tumors.¹

Oligodendrogliomas represent 3% of all primary brain tumors.¹

Medulloblastomas/embryonal/primitive tumors represent 2% of all primary brain tumors.¹

Metastatic brain tumors are the most common brain tumor, with an annual incidence more than four times greater than that of primary brain tumors.

The cancers that most commonly metastasize to the brain are lung and breast.

Survival Trends

A significant increase in survival rates for those with primary malignant brain tumors has been reported in data obtained from SEER. During 1974–1976, 22% of those diagnosed in the US with a malignant brain tumor survived five years. For those diagnosed from 1992–1998, that survival rate increased to 32%. This represents a significant statistical increase in survival over the past twenty years.⁶

For Whites, the five year survival rates for the time periods referenced above increased from 22% to 32%.⁶

For African-Americans, the five year survival rates for the time periods referenced above increased from 27% to 40%.⁶

For children under the age of fifteen, the five year survival rates for the time periods referenced above increased from 55% to 70%.⁶

NOTE: The term “five year survival” does not mean that the people in this study lived only five years. Five years is a standard “goal” in measuring survival for most diseases. Five year survival statistics do not tell us how many people lived longer. Those statistics require a longer-term follow-up of people diagnosed with that disease, which can be challenging to do in our society.

Sources

- ¹ CBTRUS (2002-2003). Primary Brain Tumors in the United States Statistical Report 1995-1999. Central Brain Tumor Registry of the United States.
- ² Ries LAG, Smith MA, Gurney JG, Linet M, Tamra T, Young JL, Bunin GR (eds). Cancer Incidence and Survival among Children and Adolescents: United States SEER Program 1975-1995, National Cancer Institute, SEER Program. NIH Pub. No. 99-4649. Bethesda, MD, 1999.
- ³ Lenhard Jr. RE, Osteen RT, Gansler T. Clinical Oncology, American Cancer Society, 2001, p. 655.
- ⁴ Legler JM, Ries LAG, Smith MA, Warren JL, et al. "Brain and Other Central Nervous System Cancers: Recent Trends in Incidence and Mortality." Journal of the National Cancer Institute, Vol. 91, No. 16, August 18, 1999, pp. 1382-1390.
- ⁵ Davis FG, Kupelian V, Freels S, McCarthy B, Surawicz T. "Prevalence estimates for primary brain tumors in the United States by behavior and major histology groups." Neuro-Oncology, Vol. 3, No. 3, June, 2001, pp. 152-158.
- ⁶ Jemal A, Thomas A, Murray T, Samuels A, et al. Cancer Statistics, 2003. CA: A Cancer Journal for Clinicians. American Cancer Society. Jan/Feb 2003, Vol. 53, No. 1., pp. 5-26.
- ⁷ Smith MA, Freidlin B, Ries LAG, Simon R. "Trends in reported incidence of primary malignant brain tumors in children in the United States." Journal of the National Cancer Institute, Sept 1998, Vol. 90, No. 17, pp. 1269-1277.

For Additional Information

In 1990, the American Brain Tumor Association conducted a feasibility study to evaluate the status of brain tumor data collection, and to determine the practicality of starting a registry whose purpose would be the collection of statistics for both benign and malignant brain tumors. The results of that study highlighted both the need and feasibility of such a registry. The American Brain Tumor Association then incorporated the Central Brain Tumor Registry of the United States (CBTRUS), and provided organizational and financial support to the new entity.

CBTRUS was incorporated as a not-for-profit organization in 1992 to provide a resource for the gathering and circulating of current information on all primary brain tumors, benign and malignant, for the purposes of:

- describing incidence and survival patterns
- evaluating diagnosis and treatment
- facilitating etiologic (causation) studies
- establishing awareness of the disease
- and, ultimately, for the prevention of all brain tumors

State or regional tumor registries obtain information about brain tumor patients from hospitals in their area. CBTRUS began by collecting information from four registries that were already collecting data on benign and malignant brain tumors. Using their preliminary data, CBTRUS conducted studies to determine diagnostic accuracy and data completeness. They now have the voluntary collaboration of 15 state registries, and encourage other population-based registries that collect data on benign and malignant brain tumors to contact them about their efforts. The data collected is used to define incidence rates of all primary brain tumors, and can be used by researchers to identify geographic clusters of patients.

CBTRUS joined the North American Brain Tumor Coalition in supporting federal legislation (Public Law 107-260) that passed in October 2002 that enables government funded surveillance organizations to collect data on primary benign brain tumors beginning in 2004.

Please visit the web site of the Central Brain Tumor Registry at www.cbtrus.org. For more information or additional statistical data on primary brain tumors contact CBTRUS at 3333 West 47th Street, Chicago, Illinois 60632. Phone: 630-655-4786 Web: www.cbtrus.org