

Table 31.1  
Benign Brain Tumors

A Comparison of Benign/Borderline and Malignant Brain Tumors  
Counts, Percents and Age-Adjusted Incidence Rates<sup>a</sup> by WHO Histology Grouping, 2005-2009

WHO Histology Grouping	Benign/Borderline			Malignant		
	Count	Percent	Rate	Count	Percent	Rate
<b>Brain</b>						
Diffuse astrocytoma (protoplasma, fibrillary)	-	-	-	417	1.4%	0.1
Anaplastic astrocytoma	-	-	-	1,578	5.4%	0.4
Glioblastoma	-	-	-	13,130	45.1%	3.2
Pilocytic astrocytoma	-	-	-	1,141	3.9%	0.3
Unique astrocytoma variants	291	0.5%	0.1	115	0.4%	0.0
Oligodendroglioma	-	-	-	1,146	3.9%	0.3
Anaplastic oligodendroglioma	-	-	-	473	1.6%	0.1
Ependymoma/anaplastic ependymoma	-	-	-	577	2.0%	0.1
Ependymoma variants	-	-	-	-	-	-
Mixed glioma	-	-	-	832	2.9%	0.2
Astrocytoma, NOS	-	-	-	1,612	5.5%	0.4
Glioma, NOS	33	0.1%	0.0	1,578	5.4%	0.4
Choroid plexus	187	0.3%	0.0	36	0.1%	0.0
Neuroepithelial	-	-	-	71	0.2%	0.0
Neuronal/glial, neuronal and mixed	833	1.5%	0.2	70	0.2%	0.0
Embryonal/primitive/medulloblastoma	-	-	-	960	3.3%	0.2
Nerve sheath	301	0.5%	0.1	18	0.1%	0.0
Meningioma	386	0.7%	0.1	-	-	-
Hemangioma and hemangioblastoma	1,470	2.6%	0.4	-	-	-
Germ cell tumors, cysts, and heterotopias	85	0.2%	0.0	122	0.4%	0.0
Chordoma/chondrosarcoma	-	-	-	28	0.1%	0.0
Craniopharyngioma	84	0.2%	0.0	-	-	-
Neoplasm, unspecified	1,235	2.2%	0.3	1,273	4.4%	0.3
Other histologies <sup>b</sup>	18	0.0%	0.0	-	-	-
<b>Intracranial Meninges</b>						
Neuroepithelial	-	-	-	-	-	-
Nerve sheath	-	-	-	-	-	-
Meningioma	27,882	50.1%	6.7	401	1.4%	0.1
Hemangioma and hemangioblastoma	22	0.0%	0.0	-	-	-
Chordoma/chondrosarcoma	-	-	-	-	-	-
Neoplasm, unspecified	60	0.1%	0.0	-	-	-
Other histologies <sup>b</sup>	-	-	-	-	-	-
<b>Cranial Nerves and Other CNS</b>						
Glioblastoma	-	-	-	-	-	-
Pilocytic astrocytoma	-	-	-	56	0.2%	0.0
Astrocytoma, NOS	-	-	-	-	-	-
Glioma, NOS	-	-	-	181	0.6%	0.0
Neuronal/glial, neuronal and mixed	-	-	-	-	-	-
Nerve sheath	5,938	10.7%	1.4	26	0.1%	0.0
Meningioma	24	0.0%	0.0	-	-	-
Hemangioma and hemangioblastoma	26	0.0%	0.0	-	-	-
Germ cell tumors, cysts, and heterotopias	-	-	-	-	-	-
Chordoma/chondrosarcoma	-	-	-	-	-	-
Neoplasm, unspecified	48	0.1%	0.0	-	-	-
Other histologies <sup>b</sup>	-	-	-	-	-	-

Source: SEER 18 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana, New Jersey and Georgia excluding ATL/RG).

Count and percent may not sum to total due to suppression and rounding.

<sup>a</sup> Rates are age-adjusted to the 2000 US Std Population (19 age groups - Census P25-1130). The histologic groupings exclude lymphomas, mesotheliomas, and Kaposi Sarcoma.

<sup>b</sup> Includes histologies not included in current groupings.

- Statistic not shown due to fewer than 16 cases during the time period.

Table 31.1 - continued  
Benign Brain Tumors

A Comparison of Benign/Borderline and Malignant Brain Tumors  
Counts, Percents and Age-Adjusted Incidence Rates<sup>a</sup> by WHO Histology Grouping, 2005-2009

WHO Histology Grouping	Benign/Borderline			Malignant		
	Count	Percent	Rate	Count	Percent	Rate
<b>Sellar Region</b>						
Glioblastoma	-	-	-	-	-	-
Pilocytic astrocytoma	-	-	-	-	-	-
Ependymoma/anaplastic ependymoma	-	-	-	-	-	-
Glioma, NOS	-	-	-	-	-	-
Pineal parenchymal	71	0.1%	0.0	93	0.3%	0.0
Embryonal/primitive/medulloblastoma	-	-	-	-	-	-
Nerve sheath	-	-	-	-	-	-
Meningioma	-	-	-	-	-	-
Germ cell tumors, cysts, and heterotopias	-	-	-	167	0.6%	0.0
Chordoma/chondrosarcoma	-	-	-	-	-	-
Pituitary	12,882	23.1%	3.1	37	0.1%	0.0
Craniopharyngioma	637	1.1%	0.2	-	-	-
Neoplasm, unspecified	318	0.6%	0.1	36	0.1%	0.0
Other histologies <sup>b</sup>	-	-	-	-	-	-
<b>Spinal Cord</b>						
Diffuse astrocytoma (protoplasma, fibrillary)	-	-	-	-	-	-
Anaplastic astrocytoma	-	-	-	22	0.1%	0.0
Glioblastoma	-	-	-	27	0.1%	0.0
Pilocytic astrocytoma	-	-	-	62	0.2%	0.0
Unique astrocytoma variants	-	-	-	-	-	-
Ependymoma/anaplastic ependymoma	-	-	-	453	1.6%	0.1
Ependymoma variants	385	0.7%	0.1	-	-	-
Mixed glioma	-	-	-	-	-	-
Astrocytoma, NOS	-	-	-	82	0.3%	0.0
Glioma, NOS	-	-	-	17	0.1%	0.0
Neuronal/glial, neuronal and mixed	68	0.1%	0.0	20	0.1%	0.0
Embryonal/primitive/medulloblastoma	-	-	-	18	0.1%	0.0
Nerve sheath	608	1.1%	0.1	36	0.1%	0.0
Meningioma	34	0.1%	0.0	-	-	-
Hemangioma and hemangioblastoma	178	0.3%	0.0	-	-	-
Chordoma/chondrosarcoma	-	-	-	19	0.1%	0.0
Neoplasm, unspecified	59	0.1%	0.0	16	0.1%	0.0
Other histologies <sup>b</sup>	-	-	-	-	-	-
<b>Spinal Meninges</b>						
Ependymoma/anaplastic ependymoma	-	-	-	-	-	-
Neuronal/glial, neuronal and mixed	-	-	-	-	-	-
Nerve sheath	42	0.1%	0.0	-	-	-
Meningioma	1,298	2.3%	0.3	-	-	-
Hemangioma and hemangioblastoma	-	-	-	-	-	-
Neoplasm, unspecified	-	-	-	-	-	-
Other histologies <sup>b</sup>	-	-	-	-	-	-
<b>Total</b>	<b>55,705</b>	<b>100.0%</b>	<b>13.4</b>	<b>29,139</b>	<b>100.0%</b>	<b>7.0</b>

Source: SEER 17 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana and New Jersey).

Count and percent may not sum to total due to suppression and rounding.

- Statistic not shown due to fewer than 16 cases during the time period.

<sup>a</sup> Rates are age-adjusted to the 2000 US Std Population (19 age groups - Census P25-1130). The histologic groupings exclude lymphomas, mesotheliomas, and Kaposi Sarcoma.

<sup>b</sup> Includes histologies not included in current groupings.

Table 31.2  
Benign Brain Tumors

Age-Adjusted SEER Incidence Rates<sup>a</sup> for Benign Brain Tumors, 2005-2009  
By Race, Sex and Age

Brain and Other Nervous System(Benign/Borderline)  
Excluding Endocrine Glands and Related Structures

Age	All Races			Whites			Blacks		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
All Ages	10.1	7.3	12.5	10.1	7.4	12.5	10.4	7.2	12.7
Ages <20	1.2	1.3	1.1	1.3	1.3	1.2	0.8	0.8	0.8
Ages 20-44	4.7	3.5	5.9	4.7	3.6	6.0	4.1	2.8	5.3
Ages 45-64	15.1	10.2	19.8	15.0	10.2	19.6	15.5	10.2	20.0
Ages 65-74	30.9	22.2	38.2	30.5	22.3	37.6	33.0	23.3	40.0
Ages 75-84	41.3	29.5	49.5	41.2	29.6	49.4	44.9	31.8	52.4
Ages 85+	51.9	40.4	57.2	51.5	40.6	56.5	65.2	44.8	72.9

Brain and Other Nervous System(Benign/Borderline)  
Including Endocrine Glands and Related Structures

Age	All Races			Whites			Blacks		
	Total	Males	Females	Total	Males	Females	Total	Males	Females
All Ages	13.5	10.6	16.1	13.1	10.3	15.7	16.0	13.0	18.5
Ages <20	1.9	1.7	2.1	2.0	1.8	2.2	1.3	1.1	1.5
Ages 20-44	7.9	5.6	10.3	7.8	5.6	10.1	8.7	5.7	11.4
Ages 45-64	19.9	15.5	24.3	19.2	14.8	23.5	24.1	19.7	27.8
Ages 65-74	38.3	31.2	44.3	36.9	30.3	42.7	49.1	42.2	54.1
Ages 75-84	48.7	39.5	55.1	47.9	38.7	54.4	60.0	53.7	63.6
Ages 85+	56.7	47.7	60.9	55.7	47.5	59.5	79.3	63.2	85.4

Source: SEER 18 areas (San Francisco, Connecticut, Detroit, Hawaii, Iowa, New Mexico, Seattle, Utah, Atlanta, San Jose-Monterey, Los Angeles, Alaska Native Registry, Rural Georgia, California excluding SF/SJM/LA, Kentucky, Louisiana, New Jersey and Georgia excluding ATL/RG).

<sup>a</sup> Rates are age-adjusted to the 2000 US Std Population (19 age groups - Census P25-1130).  
- Rate not shown due to fewer than 16 cases during the time period.

Table 31.3

Brain Tumor Histology Groupings<sup>a</sup>

Site Group	ICD-0-3 Morphology
<b>Tumors of Neuroepithelial Tissue</b>	
Diffuse astrocytoma (protoplasma, fibrillary)	9410, 9420
Anaplastic astrocytoma	9401, 9411
Glioblastoma	9440, 9441, 9442/3
Pilocytic astrocytoma	9421
Unique astrocytoma variants	9383, 9384, 9424
Oligodendroglioma	9450
Anaplastic oligodendroglioma	9451, 9460
Ependymoma/anaplastic ependymoma	9391, 9392, 9393
Ependymoma variants	9394
Mixed glioma	9382
Astrocytoma, NOS	9400
Glioma, NOS	9380
Choroid plexus	9390
Neuroepithelial	9381, 9423, 9430, 9444
Benign and Malignant neuronal/glial, neuronal and mixed	8680/1, 8680/3, 8681, 8682, 8690, 8693, 9412, 9413, 9442/1, 9490-9493, 9500, 9505, 9506, 9522, 9523
Pineal parenchymal	9360, 9361, 9362
Embryonal/primitive/medulloblastoma	8963, 9363, 9364, 9470-9474, 9501-9503, 9508
<b>Tumors Of Cranial And Spinal Nerves</b>	
Nerve sheath, benign and malignant	9540, 9541, 9550, 9560, 9561, 9570, 9571
<b>Tumors Of The Intracranial Meninges</b>	
Meningioma, benign and malignant	9530-9534, 9537-9539
Other mesenchymal, benign and malignant	8324, 8728, 8800-8806, 8810, 8815, 8824, 8830, 8831, 8850, 8851, 8857, 8861, 8890, 8897, 8900, 8910, 8920, 8990, 9040, 9150, 9180, 9210, 9241, 9260, 9480
Hemangioblastoma and hemagioblastoma	9120-9123, 9125, 9130, 9131, 9133, 9140, 9161, 9535
<b>Germ Cell Tumors And Cysts</b>	
Germ cell tumors, cysts, and heterotopias	8020, 9060, 9061, 9064, 9065, 9070-9072, 9080-9085, 9100
<b>Local Extensions From Regional Tumors</b>	
Chordoma/chondrosarcoma	9220, 9231, 9240, 9370-9373
<b>Tumors Of The Sellar Region</b>	
Pituitary	8022, 8040, 8140, 8146, 8246, 8260, 8270, 8271, 8272, 8280, 8281, 8290, 8300, 8310, 8323, 8333, 8334, 9582
Craniopharyngioma	9350, 9351, 9352
<b>Unclassified Tumors</b>	
Neoplasm, unspecified	8000-8005, 8010, 8013, 8021
All other	any remaining histologies not included in above categories

Source: Modified from CBTRUS (2005). Statistical Report: Primary Brain Tumors in the United States, 1998-2002. Published by the Central Brain Tumor Registry of the United States.

<sup>a</sup> The histologic groupings exclude lymphomas, mesotheliomas, and Kaposi Sarcoma.