

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, 2009-2013

WHO Histology Grouping	Benign/Borderline			Malignant		
	Count	Percent	Rate	Count	Percent	Rate
<b>Brain</b>						
Diffuse astrocytoma (protoplasma, fibrillary)	-	-	-	342	1.1%	0.1
Anaplastic astrocytoma	-	-	-	1,834	5.9%	0.4
Glioblastoma	-	-	-	14,538	46.7%	3.2
Pilocytic astrocytoma	-	-	-	1,251	4.0%	0.3
Unique astrocytoma variants	387	0.5%	0.1	155	0.5%	0.0
Oligodendroglioma	-	-	-	1,082	3.5%	0.2
Anaplastic oligodendroglioma	-	-	-	481	1.5%	0.1
Ependymoma/anaplastic ependymoma	-	-	-	585	1.9%	0.1
Ependymoma variants	-	-	-	-	-	-
Mixed glioma	-	-	-	876	2.8%	0.2
Astrocytoma, NOS	-	-	-	1,479	4.7%	0.3
Glioma, NOS	82	0.1%	0.0	1,641	5.3%	0.4
Choroid plexus	185	0.3%	0.0	35	0.1%	0.0
Neuroepithelial	-	-	-	76	0.2%	0.0
Neuronal/glial, neuronal and mixed	928	1.3%	0.2	62	0.2%	0.0
Embryonal/primitive/medulloblastoma	-	-	-	925	3.0%	0.2
Nerve sheath	295	0.4%	0.1	-	-	-
Meningioma	242	0.3%	0.1	-	-	-
Other mesenchymal	165	0.2%	0.0	63	0.2%	0.0
Hemangioma and hemangioblastoma	2,026	2.8%	0.5	-	-	-
Germ cell tumors, cysts, and heterotopias	83	0.1%	0.0	114	0.4%	0.0
Chordoma/chondrosarcoma	-	-	-	25	0.1%	0.0
Craniopharyngioma	94	0.1%	0.0	-	-	-
Neoplasm, unspecified	1,423	2.0%	0.3	1,272	4.1%	0.3
Other histologies <sup>b</sup>	24	0.0%	0.0	57	0.2%	0.0
<b>Intracranial Meninges</b>						
Neuroepithelial	-	-	-	-	-	-
Nerve sheath	-	-	-	-	-	-
Meningioma	35,629	50.0%	7.9	371	1.2%	0.1
Other mesenchymal	56	0.1%	0.0	34	0.1%	0.0
Hemangioma and hemangioblastoma	35	0.0%	0.0	-	-	-
Chordoma/chondrosarcoma	-	-	-	-	-	-
Neoplasm, unspecified	82	0.1%	0.0	-	-	-
Other histologies <sup>b</sup>	-	-	-	-	-	-
<b>Cranial Nerves and Other CNS</b>						
Glioblastoma	-	-	-	-	-	-
Pilocytic astrocytoma	-	-	-	92	0.3%	0.0
Astrocytoma, NOS	-	-	-	-	-	-
Glioma, NOS	-	-	-	223	0.7%	0.1
Neuronal/glial, neuronal and mixed	20	0.0%	0.0	-	-	-
Nerve sheath	7,083	9.9%	1.5	25	0.1%	0.0
Meningioma	23	0.0%	0.0	-	-	-
Other mesenchymal	-	-	-	-	-	-
Hemangioma and hemangioblastoma	27	0.0%	0.0	-	-	-
Germ cell tumors, cysts, and heterotopias	-	-	-	-	-	-
Chordoma/chondrosarcoma	-	-	-	-	-	-
Neoplasm, unspecified	34	0.0%	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, 2009-2013

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	112	0.2%	0.0	110	0.4%	0.0
Embryonal/primitive/medulloblastoma	-	-	-	16	0.1%	0.0
Nerve sheath	-	-	-	-	-	-
Meningioma	-	-	-	-	-	-
Other mesenchymal	-	-	-	-	-	-
Germ cell tumors, cysts, and heterotopias	-	-	-	175	0.6%	0.0
Chordoma/chondrosarcoma	-	-	-	-	-	-
Pituitary	17,570	24.7%	4.0	40	0.1%	0.0
Craniopharyngioma	735	1.0%	0.2	-	-	-
Neoplasm, unspecified	325	0.5%	0.1	29	0.1%	0.0
Other histologies <sup>b</sup>	-	-	-	-	-	-
<b>Spinal Cord</b>						
Diffuse astrocytoma (protoplasma, fibrillary)	-	-	-	-	-	-
Anaplastic astrocytoma	-	-	-	18	0.1%	0.0
Glioblastoma	-	-	-	35	0.1%	0.0
Pilocytic astrocytoma	-	-	-	68	0.2%	0.0
Unique astrocytoma variants	-	-	-	-	-	-
Ependymoma/anaplastic ependymoma	-	-	-	499	1.6%	0.1
Ependymoma variants	396	0.6%	0.1	-	-	-
Mixed glioma	-	-	-	-	-	-
Astrocytoma, NOS	-	-	-	76	0.2%	0.0
Glioma, NOS	-	-	-	29	0.1%	0.0
Neuronal/glial, neuronal and mixed	80	0.1%	0.0	23	0.1%	0.0
Embryonal/primitive/medulloblastoma	-	-	-	23	0.1%	0.0
Nerve sheath	914	1.3%	0.2	25	0.1%	0.0
Meningioma	44	0.1%	0.0	-	-	-
Other mesenchymal	106	0.1%	0.0	19	0.1%	0.0
Hemangioma and hemangioblastoma	177	0.2%	0.0	-	-	-
Chordoma/chondrosarcoma	-	-	-	21	0.1%	0.0
Neoplasm, unspecified	93	0.1%	0.0	24	0.1%	0.0
Other histologies <sup>b</sup>	-	-	-	-	-	-
<b>Spinal Meninges</b>						
Ependymoma/anaplastic ependymoma	-	-	-	-	-	-
Neuronal/glial, neuronal and mixed	-	-	-	-	-	-
Nerve sheath	30	0.0%	0.0	-	-	-
Meningioma	1,523	2.1%	0.3	-	-	-
Other mesenchymal	22	0.0%	0.0	-	-	-
Hemangioma and hemangioblastoma	-	-	-	-	-	-
Neoplasm, unspecified	-	-	-	-	-	-
Other histologies <sup>b</sup>	-	-	-	-	-	-
<b>Total</b>	<b>71,273</b>	<b>100.0%</b>	<b>15.9</b>	<b>31,146</b>	<b>100.0%</b>	<b>7.0</b>

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 31.2  
Benign Brain Tumors

Age-Adjusted SEER Incidence Rates<sup>a</sup> for Benign Brain Tumors, 2009-2013  
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	11.7	8.3	14.6	11.8	8.5	14.8	12.0	8.2	14.9
Ages <20	1.4	1.5	1.4	1.5	1.5	1.5	1.0	1.1	0.9
Ages 20-44	5.5	4.1	7.0	5.7	4.3	7.3	5.3	3.3	7.0
Ages 45-64	16.9	11.3	22.3	17.0	11.4	22.6	16.9	11.0	22.0
Ages 65-74	35.2	24.0	44.9	35.1	23.9	45.0	38.5	27.2	46.9
Ages 75-84	49.2	35.4	59.2	49.3	36.1	59.2	54.6	37.8	64.7
Ages 85+	63.2	48.3	70.7	63.7	49.0	71.1	67.9	45.5	77.2

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	15.9	12.3	19.2	15.8	12.2	19.1	18.8	14.8	22.1
Ages <20	2.3	2.0	2.6	2.4	2.2	2.8	1.8	1.5	2.0
Ages 20-44	9.9	7.0	13.0	10.0	7.1	13.0	11.1	6.7	15.2
Ages 45-64	22.8	17.5	27.8	22.4	17.2	27.6	27.0	21.7	31.6
Ages 65-74	44.1	34.8	52.2	42.8	33.4	51.1	56.6	50.1	61.6
Ages 75-84	58.2	47.0	66.4	57.5	46.8	65.4	72.7	60.9	79.5
Ages 85+	68.7	56.6	74.9	68.6	56.4	74.8	81.8	65.6	88.5

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.