

Table 31.1
Benign Brain Tumors

A Comparison of Benign/Borderline and Malignant Brain Tumors
Counts, Percents and Age-Adjusted Incidence Rates^a by WHO Histology Grouping, 2012-2016

WHO Histology Grouping	Benign/Borderline			Malignant		
	Count	Percent	Rate	Count	Percent	Rate
Brain						
Diffuse astrocytoma (protoplasma, fibrillary)	-	-	-	191	0.4%	0.0
Anaplastic astrocytoma	-	-	-	2,762	6.4%	0.5
Glioblastoma	-	-	-	20,908	48.3%	3.2
Pilocytic astrocytoma	-	-	-	1,619	3.7%	0.3
Unique astrocytoma variants	593	0.5%	0.1	215	0.5%	0.0
Oligodendroglioma	-	-	-	1,334	3.1%	0.2
Anaplastic oligodendroglioma	-	-	-	717	1.7%	0.1
Ependymoma/anaplastic ependymoma	-	-	-	748	1.7%	0.1
Ependymoma variants	-	-	-	-	-	-
Mixed glioma	-	-	-	761	1.8%	0.1
Astrocytoma, NOS	-	-	-	2,070	4.8%	0.3
Glioma, NOS	136	0.1%	0.0	2,359	5.4%	0.4
Choroid plexus	263	0.2%	0.0	49	0.1%	0.0
Neuroepithelial	-	-	-	121	0.3%	0.0
Neuronal/glial, neuronal and mixed	1,360	1.2%	0.2	84	0.2%	0.0
Embryonal/primitive/medulloblastoma	-	-	-	1,174	2.7%	0.2
Nerve sheath	547	0.5%	0.1	18	0.0%	0.0
Meningioma	230	0.2%	0.0	20	0.0%	0.0
Other mesenchymal	228	0.2%	0.0	95	0.2%	0.0
Hemangioma and hemangioblastoma	2,727	2.5%	0.5	16	0.0%	0.0
Germ cell tumors, cysts, and heterotopias	152	0.1%	0.0	152	0.4%	0.0
Chordoma/chondrosarcoma	-	-	-	48	0.1%	0.0
Craniopharyngioma	115	0.1%	0.0	-	-	-
Neoplasm, unspecified	1,964	1.8%	0.3	1,735	4.0%	0.3
Other histologies ^b	47	0.0%	0.0	91	0.2%	0.0
Intracranial Meninges						
Neuroepithelial	-	-	-	-	-	-
Nerve sheath	-	-	-	-	-	-
Meningioma	54,718	49.3%	8.6	491	1.1%	0.1
Other mesenchymal	85	0.1%	0.0	45	0.1%	0.0
Hemangioma and hemangioblastoma	54	0.0%	0.0	-	-	-
Chordoma/chondrosarcoma	-	-	-	-	-	-
Neoplasm, unspecified	130	0.1%	0.0	-	-	-
Other histologies ^b	-	-	-	-	-	-
Cranial Nerves and Other CNS						
Glioblastoma	-	-	-	-	-	-
Pilocytic astrocytoma	-	-	-	152	0.4%	0.0
Astrocytoma, NOS	-	-	-	-	-	-
Glioma, NOS	25	0.0%	0.0	341	0.8%	0.1
Neuronal/glial, neuronal and mixed	29	0.0%	0.0	19	0.0%	0.0
Nerve sheath	11,166	10.1%	1.8	39	0.1%	0.0
Meningioma	25	0.0%	0.0	-	-	-
Other mesenchymal	22	0.0%	0.0	-	-	-
Hemangioma and hemangioblastoma	66	0.1%	0.0	-	-	-
Germ cell tumors, cysts, and heterotopias	-	-	-	-	-	-
Chordoma/chondrosarcoma	-	-	-	-	-	-
Neoplasm, unspecified	67	0.1%	0.0	33	0.1%	0.0
Other histologies ^b	-	-	-	22	0.1%	0.0

Source: SEER 21 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, Georgia excluding ATL/RG, Idaho, New York and Massachusetts).

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

^a 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.

^b Includes histologies not included in current groupings.

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

Table 31.1 - continued
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A Comparison of Benign/Borderline and Malignant Brain Tumors
Counts, Percents and Age-Adjusted Incidence Rates^a by WHO Histology Grouping, 2012-2016

WHO Histology Grouping	Benign/Borderline			Malignant		
	Count	Percent	Rate	Count	Percent	Rate
Sellar Region						
Glioblastoma	-	-	-	-	-	-
Pilocytic astrocytoma	-	-	-	-	-	-
Ependymoma/anaplastic ependymoma	-	-	-	-	-	-
Glioma, NOS	-	-	-	-	-	-
Pineal parenchymal	123	0.1%	0.0	181	0.4%	0.0
Embryonal/primitive/medulloblastoma	-	-	-	-	-	-
Nerve sheath	-	-	-	-	-	-
Meningioma	-	-	-	-	-	-
Other mesenchymal	-	-	-	-	-	-
Germ cell tumors, cysts, and heterotopias	23	0.0%	0.0	240	0.6%	0.0
Chordoma/chondrosarcoma	-	-	-	-	-	-
Pituitary	28,086	25.3%	4.6	50	0.1%	0.0
Craniopharyngioma	1,040	0.9%	0.2	-	-	-
Neoplasm, unspecified	455	0.4%	0.1	30	0.1%	0.0
Other histologies ^b	-	-	-	-	-	-
Spinal Cord						
Diffuse astrocytoma (protoplasma, fibrillary)	-	-	-	-	-	-
Anaplastic astrocytoma	-	-	-	27	0.1%	0.0
Glioblastoma	-	-	-	55	0.1%	0.0
Pilocytic astrocytoma	-	-	-	100	0.2%	0.0
Unique astrocytoma variants	-	-	-	-	-	-
Ependymoma/anaplastic ependymoma	24	0.0%	0.0	657	1.5%	0.1
Ependymoma variants	562	0.5%	0.1	-	-	-
Mixed glioma	-	-	-	-	-	-
Astrocytoma, NOS	-	-	-	82	0.2%	0.0
Glioma, NOS	-	-	-	42	0.1%	0.0
Neuronal/glial, neuronal and mixed	119	0.1%	0.0	32	0.1%	0.0
Embryonal/primitive/medulloblastoma	-	-	-	26	0.1%	0.0
Nerve sheath	2,219	2.0%	0.4	33	0.1%	0.0
Meningioma	55	0.0%	0.0	-	-	-
Other mesenchymal	198	0.2%	0.0	16	0.0%	0.0
Hemangioma and hemangioblastoma	300	0.3%	0.0	-	-	-
Chordoma/chondrosarcoma	-	-	-	28	0.1%	0.0
Neoplasm, unspecified	150	0.1%	0.0	24	0.1%	0.0
Other histologies ^b	16	0.0%	0.0	18	0.0%	0.0
Spinal Meninges						
Ependymoma/anaplastic ependymoma	-	-	-	-	-	-
Neuronal/glial, neuronal and mixed	-	-	-	-	-	-
Nerve sheath	74	0.1%	0.0	-	-	-
Meningioma	2,481	2.2%	0.4	16	0.0%	0.0
Other mesenchymal	32	0.0%	0.0	-	-	-
Hemangioma and hemangioblastoma	18	0.0%	0.0	-	-	-
Neoplasm, unspecified	23	0.0%	0.0	-	-	-
Other histologies ^b	-	-	-	-	-	-
Total	110,946	100.0%	17.8	43,302	100.0%	7.0

Source: SEER 21 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, Idaho, New York and Massachusetts).

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

^a 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.

^b 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^a for Benign Brain Tumors, 2012-2016
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	12.8	9.2	16.0	13.0	9.4	16.4	12.3	8.6	15.1
Ages <20	1.8	1.8	1.9	2.0	1.9	2.0	1.4	1.5	1.3
Ages 20-44	6.2	4.6	7.7	6.4	4.7	8.1	5.3	3.5	6.8
Ages 45-64	18.9	12.5	25.1	19.1	12.6	25.5	18.1	11.8	23.5
Ages 65-74	38.0	26.4	47.9	38.2	26.6	48.4	37.7	26.7	45.7
Ages 75-84	52.1	37.7	62.8	52.3	38.3	62.8	55.4	39.7	64.9
Ages 85+	65.4	50.3	73.1	66.1	51.0	74.0	61.8	44.7	68.9

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	17.8	13.6	21.5	17.5	13.5	21.4	19.9	15.5	23.5
Ages <20	3.0	2.5	3.5	3.1	2.6	3.6	2.4	2.1	2.8
Ages 20-44	11.6	7.9	15.3	11.5	8.0	15.2	12.3	7.2	16.9
Ages 45-64	25.7	19.6	31.5	25.1	19.1	31.1	29.8	24.0	34.8
Ages 65-74	47.1	37.8	55.1	46.2	36.7	54.6	55.1	48.4	60.0
Ages 75-84	61.4	50.1	69.8	60.6	49.7	68.8	73.2	62.9	79.3
Ages 85+	70.9	58.3	77.4	71.0	58.6	77.4	74.9	59.6	81.3

Source: SEER 21 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, Georgia excluding ATL/RG, Idaho, New York and Massachusetts).

^a 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^a

Site Group	ICD-0-3 Morphology
Tumors of Neuroepithelial Tissue	
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
Tumors Of Cranial And Spinal Nerves	
Nerve sheath, benign and malignant	9540, 9541, 9550, 9560, 9561, 9570, 9571
Tumors Of The Intracranial Meninges	
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
Germ Cell Tumors And Cysts	
Germ cell tumors, cysts, and heterotopias	8020, 9060, 9061, 9064, 9065, 9070-9072, 9080-9085, 9100
Local Extensions From Regional Tumors	
Chordoma/chondrosarcoma	9220, 9231, 9240, 9370-9373
Tumors Of The Sellar Region	
Pituitary	8022, 8040, 8140, 8146, 8246, 8260, 8270, 8271, 8272, 8280, 8281, 8290, 8300, 8310, 8323, 8333, 8334, 9582
Craniopharyngioma	9350, 9351, 9352
Unclassified Tumors	
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.

^a The histologic groupings exclude lymphomas, mesotheliomas, and Kaposi Sarcoma.