

Brain Cancer: An overview from Medical Oncology

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Introduction: by the numbers

- Approximately 24,000 people were diagnosed with a primary malignant brain tumor or other CNS neoplasm in 2018.
- There were approximately 135,000 new diagnoses of metastatic brain tumors in the US.
- 690,000 Americans are estimated to be living with a primary brain or CNS tumor diagnosis
- Approximately 63% of new primary brain tumors are benign; 37% are malignant

Overview: “Brain tumor” describes multiple items

Benign intracranial tumors

- Meningiomas (most common benign), schwannomas, pituitary adenomas, hemangioblastomas, chranio-pharyngiomas, choroid plexus papillomas

Metastatic disease: brain malignancy from cancer that started elsewhere

- Most common reason for adult intracranial mass
- Lung, breast, colon, kidney, melanoma

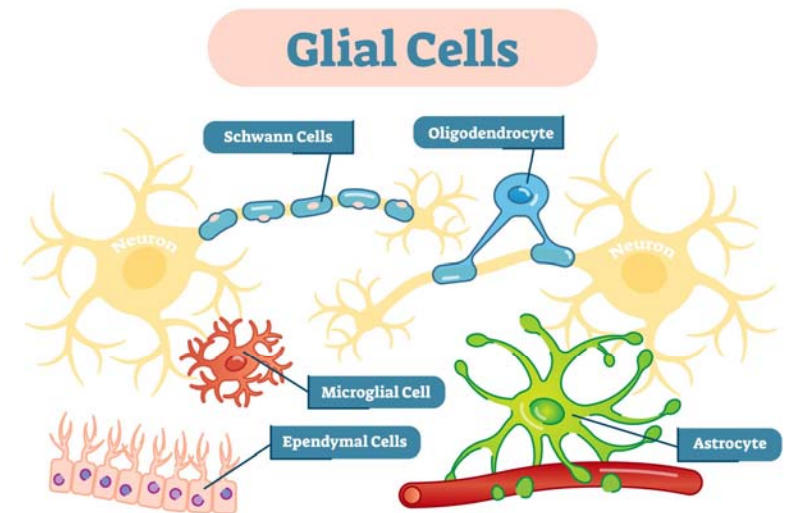
Lymphoma arising in the central nervous system (primary CNS lymphoma)

Primary brain/CNS tumors: brain malignancy from within the brain/central nervous system

Most common malignant primary brain tumors: gliomas

Glioma: supportive cells in the brain

- **Astrocytoma:**
 - From star-shaped glial cells called astrocytes.
 - Grade I or II astrocytoma: low-grade glioma
 - Grade III astrocytoma: high-grade or anaplastic astrocytoma
 - Grade IV astrocytoma: glioblastoma (GBM) or malignant astrocytic glioma. 50% of all gliomas.
- **Oligodendroglioma:**
 - Oligodendrocytes produce the myelin to insulate nerves in the CNS.
 - Seen most frequently in middle-aged adults.
 - Tend to be grade II or III.
 - Tend to be slower-growing than astrocytomas and with a better prognosis



Risk factors

- **Prior radiation** as treatment for leukemia/lymphoma/scalp ringworm 1950s (risk for gliomas)
- Certain rare **genetic disorders**
 - Astrocytomas: Li-Fraumeni, Neurofibromatosis type 1, tuberous sclerosis, Lynch syndrome
 - Medulloblastoma: Li-Fraumeni, basal cell nevus syndrome, familial adenomatous polyposis
- **Immunodeficiency**, e.g. HIV (risk for CNS lymphoma)
- No known lifestyle risk factors (alcohol, tobacco, cell phones)

Mainstays of treatment

Surgery

Radiation

Chemotherapy

- Traditional
- Anti-blood vessel (anti-angiogenic)
- Immune therapy (checkpoint inhibitors, CAR-T)
- Alternating electric field therapy

Supportive therapy

- Steroids
- Symptomatic control: anti-emetics, anti-epileptics, pain control
- Family/Social support

References

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