# Brain tumor risk factors

Age. Brain tumors are more common in children and older adults, although people of any age can develop a brain tumor.

Gender. In general, men are more likely than women to develop a brain tumor. However, some specific types of brain tumors, such as meningioma, are more common in women.

Home and work exposures. Exposure to solvents, pesticides, oil products, rubber, or vinyl chloride may increase the risk of developing a brain tumor. However, there is not yet scientific evidence that supports this possible link.

Family history. About 5% of brain tumors may be linked to hereditary genetic factors or conditions, including Li-Fraumeni syndrome, neurofibromatosis, nevoid basal cell carcinoma syndrome, tuberous sclerosis, Turcot syndrome, and von Hippel-Lindau disease. Scientists have also found “clusters” of brain tumors within some families without a link to these known hereditary conditions. Studies are underway to try to find a cause for these clusters.

Exposure to infections, viruses, and allergens. Infection with the Epstein-Barr virus (EBV) increases the risk of CNS lymphoma. EBV is more commonly known as the virus that causes mononucleosis or “mono.” In other research, high levels of a common virus called cytomegalovirus (CMV) have been found in brain tumor tissue. The meaning of this finding is being researched. Several types of other viruses have been shown to cause brain tumors in research on animals. More data are needed to find out if exposure to infections, other viruses, or allergens increase the risk of a brain tumor in people. Of note, studies have shown that patients with a history of allergies or skin conditions have a lower risk of glioma.

Electromagnetic fields. Most studies evaluating the role of electromagnetic fields, such as energy from power lines or from cell phone use, show no link to an increased risk of developing a brain tumor in adults. Because of conflicting information regarding risk in children, the World Health Organization (WHO) recommends limiting cell phone use and promotes the use of a hands-free headset for both adults and children.

Race and ethnicity. In the United States, white people are more likely to develop gliomas but less likely to develop meningioma than Black people. Also, people from northern Europe are more than twice as likely to develop a brain tumor as people in Japan.

Ionizing radiation. Previous treatment to the brain or head with ionizing radiation, including x-rays, has been shown to be a risk factor for a brain tumor.

Head injury and seizures. Serious head trauma has long been studied for its relationship to brain tumors. Some studies have shown a link between head trauma and meningioma but not between head trauma and glioma. A history of seizures has also been linked with brain tumors, but because a brain tumor can cause seizures, it is not known if seizures increase the risk of brain tumors, if seizures occur because of the tumor, or if anti-seizure medication increases the risk.

N-nitroso compounds. Some studies of diet and vitamin supplementation seem to indicate that dietary N-nitroso compounds may raise the risk of both childhood and adult brain tumors. Dietary N-nitroso compounds are formed in the body from nitrites or nitrates found in some cured meats, cigarette smoke, and cosmetics. However, additional research is necessary before a definitive link can be established.

Air Pollution as a brain tumor risk factor.