Types of Cancer

Brain Cancer

What is brain cancer?

Cancer develops when cells grow out of control. There are several types of primary brain cancer (meaning they start in the brain), with the most common being gliomas and glioblastomas, meningiomas, pituitary adenomas, schwannomas and medulloblastomas. Most of these names relate to where in the brain they are located.

Cancer may also arise elsewhere in the body and spread to the brain or spinal cord (the central nervous system), a process known as metastasis. In adults, about half of all brain cancers spread from elsewhere, especially from lung, breast and colon cancers and melanoma. Lymphoma may spread to the brain from elsewhere in the body or start in the brain (primary CNS lymphoma).

Who gets brain cancer?

Brain cancer is uncommon, and the lifetime risk of developing a malignant tumor of the brain or spinal cord is less than 1 percent. About 23,800 brain and spinal cord cancers are diagnosed in the United States each year, and about 16,700 people die from these cancers annually, according to the American Cancer Society.

Slightly more men than women develop brain and spinal cord cancer. In the United States, this translates to about 13,450 men and 10,350 women annually. In children, brain tumors are the second most common type of cancer, accounting for 25 percent of childhood cancers. People in different age groups have an increased risk for developing specific types of brain cancer. For example, low-grade gliomas are more likely to occur in younger people, while high-grade glioblastomas are more common in adults over 40.

Survival rates depend on the type of cancer and how aggressive it is. Some people get benign brain tumors that are noncancerous and do not spread. However, some of these benign tumors may eventually transform into cancerous tumors and need to be monitored.

What are the risk factors for brain cancer?

Many types of brain cancer have no known risk factor and in most cases there is no clear cause. Genetic factors, environmental toxins, radiation to the head and cigarette smoking have all been linked to cancers of the brain and spinal cord. Some inherited diseases, such as neurofibromatosis and retinoblastoma, increase the risk for central nervous system tumors. HIV infection is also associated with an increased risk for some brain cancers.

What are the symptoms of brain cancer?

Many brain tumors do not cause symptoms. Some are found accidentally if brain imaging with a computed tomography (CT) or MRI scan is done for another reason. When symptoms do occur, they vary depending on which part of the brain or spinal cord is affected. Common symptoms may include:

- Headache
- Weakness or paralysis
- Nausea or vomiting
- Clumsiness or lack of coordination
- Difficulty walking
- Seizures
- Changes in vision, hearing, touch or taste
- Speech problems
- Mood, personality or behavior changes
- Mental confusion, trouble concentrating or memory problems

Many people with brain cancer do not develop symptoms until its late stages, when it is harder to treat.

How is brain cancer diagnosed?

Early detection and treatment of brain cancer increases the likelihood of long-term survival. Diagnosing brain cancer starts with a physical exam and health history. Often, brain imaging with a CT scan will be ordered. This is an imaging technique that uses X-rays to create a three-dimensional map of the brain. Sometimes an MRI scan is done as well. Other tests may be ordered, such as blood and urine tests, to determine what other health issues may be present.

If a tumor is evident from imaging and other tests, a biopsy or tissue sample may be done. Either a small hole is drilled into the skull and a device is inserted to remove a piece of the tumor or more extensive surgery is done in which the whole tumor is removed. A sample from the tumor is tested to determine if it is cancerous.

How is brain cancer treated?

Treatment for brain and spinal cord cancer varies depending on the type of tumor, the symptoms it causes and other medical conditions. It also depends on how advanced the cancer is when it is detected, how many tumors there are and how large they are.

People with brain cancer may need to see several specialists, such as neurosurgeons (nerve and

brain specialists), oncologists and radiologists. Other people on the health care team may include nurse oncologists, physiotherapists, pharmacists, psychologists, dietitians and social workers.

Surgery: Some small and localized brain tumors can be surgically removed; this is known as resection.

Radiation: Radiation may be used to kill any cancer cells that remain after surgery or to shrink tumors that cannot be surgically removed. It is often used in conjunction with other forms of treatment.

Chemotherapy: Traditional chemotherapy works by killing fast-growing cells, including cancer cells. It can also destroy rapidly dividing healthy cells, such as those in the gut or hair follicles, leading to side effects like nausea and hair loss. In some cases, chemotherapy is directly administered into the brain or spinal cord.

Targeted therapy: Targeted drugs work against cancers with specific characteristics. For example, they may interfere with signaling pathways that regulate cell growth. Targeted treatment is often better tolerated than chemotherapy, but cancer may develop resistance over time.

Immunotherapy: The newest type of treatment helps the immune system fight cancer. For example, some tumors can turn off immune responses against them, and drugs known as checkpoint inhibitors can restore T cells' ability to recognize and destroy cancer cells. Immunotherapy has shown promising results for some types of brain cancer. However, current immunotherapy drugs work for only a subset of patients, and it is hard to predict who will benefit.

For more information on liver cancer, visit:

American Cancer Society

National Cancer Institute

American Society of Clinical Oncology (ASCO)

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