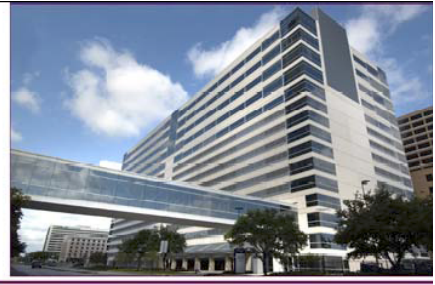


Baylor Clinic Healthletter



Focus on Brain Cancer

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By Raymond Sawaya, M.D., Professor and Chair, and Youssef G. Comair, M.D., Professor and Vice-Chair, Department of Neurosurgery, Baylor College of Medicine

Earlier this week, U.S. Sen. Edward M. Kennedy (D-Mass) was hospitalized after suffering a seizure at the family's home in Massachusetts. A preliminary biopsy of Kennedy's brain identified the cause of his seizure was a cancerous brain tumor, more specifically, malignant glioma.

As one of America's most enduring and well-known political figures, Kennedy's illness has the media and the general public searching for more information on brain cancer, its causes, symptoms, treatment options and long-term prognosis.

Drs. Raymond Sawaya and Youssef G. Comair of Baylor College of Medicine's (BCM) department of Neurosurgery are among the highly acclaimed team of physicians and researchers at BCM advancing the care and treatment of patients with brain tumors. Dr. Sawaya serves as professor and chair of the department of Neurosurgery at BCM, as well as chair of the department of Neurosurgery at the University of Texas M.D. Anderson Cancer Center and director of M.D. Anderson's Brain Tumor Center. Dr. Comair serves as professor and vice chair of Neurosurgery at BCM and as chief of the Neurosurgery service at St. Luke's Episcopal Hospital. Both physicians are also members of the Dan L. Duncan Cancer Center at Baylor College of Medicine.

Below, Drs. Sawaya and Comair answer some of the questions being raised today about brain tumors.

What is malignant glioma?

Malignant glioma is the most common type of primary brain tumor, accounting for more than half of the 18,000 primary malignant brain tumors diagnosed each year in the United States, according to the National Cancer Institute. It is, however, a rare tumor. A primary brain tumor means the cancer originated in the brain, versus resulting from cancer cells that originated in another part of the body and spread to the brain (known as a secondary or metastatic brain tumor).

Primary brain tumors are named based on the type of cells or the part of the brain in which they began. In Kennedy's case, the tumor began in the glial cells, which help support and protect critical areas of the brain. Gliomas are responsible for about 42% of all primary adult brain tumors.

What causes brain tumors?

The exact cause of brain tumors is unknown. However, research has shown that people with certain risk factors are more likely than others to develop a brain tumor. These risk factors include:

- **Being male** – In general, brain tumors are more common in males than females.
- **Race** – Brain tumors occur more often among white people than other races.
- **Age** – Most brain tumors are detected in people who are 70 years old or older. (Sen. Kennedy is 76.) However, brain tumors are the second most common cancer in children and are more common in children younger than 8 years old.
- **Family history** – People with family members who have gliomas may be more likely to develop this disease.

- **Exposure to radiation or certain chemicals** – These include formaldehyde, vinyl chloride (used to make plastics, among other things), and acrylonitrile (used to make textiles and plastics).

Scientists continue to investigate the risk posed by cell phones and head injuries, but studies have not found either to increase the risk of brain tumors.

Keep in mind most people who have these known risk factors do not get brain cancer. At the same time, many of those who do get the disease have none of these risk factors. If you think you are at risk, we recommend you discuss your concerns with your physician and how you can reduce your risk.

What are the symptoms of brain cancer?

The symptoms will vary based on the individual's type of tumor, location and size, but may include:

- Headaches (usually worse in the morning)
- Nausea or vomiting
- Changes in speech, vision or hearing
- Problems balancing or walking
- Changes in mood, personality or ability to concentrate
- Problems with memory
- Muscle jerking or twitching (seizures or convulsions)
- Numbness or tingling in the arms or legs

These symptoms may be caused by the tumor pressing on a critical brain area that can result in a seizure, which is an irritation of brain cells.

Again, keep in mind these symptoms are not sure signs of a brain tumor. They could indicate other conditions and should be evaluated by a neurologist as soon as possible.

How do you diagnose brain tumors?

Typically you begin with a thorough exam by a neurologist to check your vision, hearing, balance, coordination and reflexes. Depending on those results, the physician may then request an imaging test such as a Magnetic Resonance Imaging (MRI) scan. If an MRI cannot be performed, a Computed Tomography (CT) scan of the brain is done.

At times, a biopsy is performed to confirm the diagnosis of a glioma. The biopsy involves removing a tiny piece of the tumor and then having the tissue examined under a microscope by a neuropathologist (a pathologist who specializes in brain tumors) to determine the kind of tumor and proper treatment. Newer diagnostic tests such as molecular make-up and gene deletion tests are not available in most hospitals, but can be performed at BCM.

How are brain tumors treated?

Treatments to remove or reduce the glioma include surgery (removing as much of the glioma as possible while minimizing damage to healthy tissue), radiation, chemotherapy or a combination of these treatment options. However, because gliomas can be complex, specific treatment depends on the type of glioma tumor, size and location, as well as the age and overall health of the individual.

The first treatment option is removal of the glioma. At times this is not feasible because the tumor is located in an area of the brain that is essential for function. Frequently in tumors near functional areas, surgery is performed with the patient awake to map critical areas of the brain and spare them. The use of computerized image guidance in the operating room has also increased the effectiveness of removing the tumor.

Because of the complexity involved, treatment should be a team process that integrates the expertise of multiple specialties. At Baylor College of Medicine, our team includes highly acclaimed neurologists, neuro-oncologists, neurosurgeons, radiologists, neuropathologists, radiation therapists, medical oncologists,

psychologists and brain rehabilitation specialists, all working together to deliver the best treatment program for the individual patient while expediting testing and treatment.

What is the survival rate?

The prognosis for brain tumor patients depends on the particulars of each individual patient and their tumor. In general, primary brain cancers are typically very aggressive and life threatening. Average survival can range from less than a year for very advanced and aggressive types to varying survival rates for benign gliomas. A good long-term survival can be up to 10 years or more, and most patients continue to be completely functional and carry on with their lives. Disabilities can occur if the tumor or its treatment have affected a particular center in the brain. This could result in loss of speech, weakness or paralysis, although with rehabilitation these functions can improve.

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***Youssef G. Comair, M.D.**, professor and vice-chair of the department of Neurosurgery at BCM, serves as chief of Neurosurgery at St. Luke's Episcopal Hospital. Dr. Comair received his medical degree from St. Joseph University, Beirut, Lebanon. Following a cerebrovascular research fellowship at the University of Iowa, he completed his residency in neurosurgery at the Montreal Neurological Institute, McGill University. Dr. Comair practiced for several years at the Cleveland Clinic prior to his appointment as professor and chair of the department of Neurosurgery at the American University of Beirut Medical Center. He specializes in functional neurosurgery, brain tumors and in the application of deep brain stimulation.*

The department of Neurosurgery at Baylor College of Medicine provides the highest-quality neurosurgical care for patients who have an illness or injury that affects the brain, spinal cord and spinal column, or peripheral nerves throughout all parts of the body (hands, legs, arms, face). We provide services for all aspects of neurosurgical disorders and diseases, including advanced specialized care. Our specialty trained and experienced physicians are internationally recognized in the field of neurosurgery, including appearing in "Best Doctors" and "Who's Who in Medicine and Healthcare" listings, and are active in the latest research.

Patients are typically referred to Neurosurgery for evaluation of symptoms that include headache, hearing loss, vision problems, seizures, stroke, back pain, facial pain, cognitive impairment and movement disorders. Our neurosurgeons provide valuable information to help the patient and their family decide on a course of treatment. We offer all patients compassionate, patient-centric care, easily available appointments and timely follow-up.

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