

**LEARNING ABOUT
CLINICAL TRIALS**

The radiation oncology team is constantly exploring new ways to treat brain tumors through studies called clinical trials. Today's standard treatments are the result of clinical trials proving that radiation therapy kills tumors and is safe long-term. For more information on clinical trials, visit:

National Cancer Institute
www.cancer.gov

Radiation Therapy Answers
www.rtanswers.org

**HELPFUL WEBSITES
ON BRAIN TUMORS**

American Brain Tumor Association
www.abta.org

National Brain Tumor Society
www.braintumor.org



**ABOUT THE
RADIATION ONCOLOGY TEAM**

Radiation oncologists are the doctors who oversee the care of each person undergoing radiation treatment. Other members of the treatment team include radiation therapists, radiation oncology nurses, medical physicists, dosimetrists, social workers and nutritionists. For information on what each of these professionals does or to locate a radiation oncologist near you, visit www.rtanswers.org.

**ABOUT
ASTRO**

The American Society for Radiation Oncology is the largest radiation oncology society in the world with more than 10,000 members who specialize in treating cancer with radiation therapies. ASTRO is dedicated to improving patient care through education, clinical practice, advancement of science and advocacy.

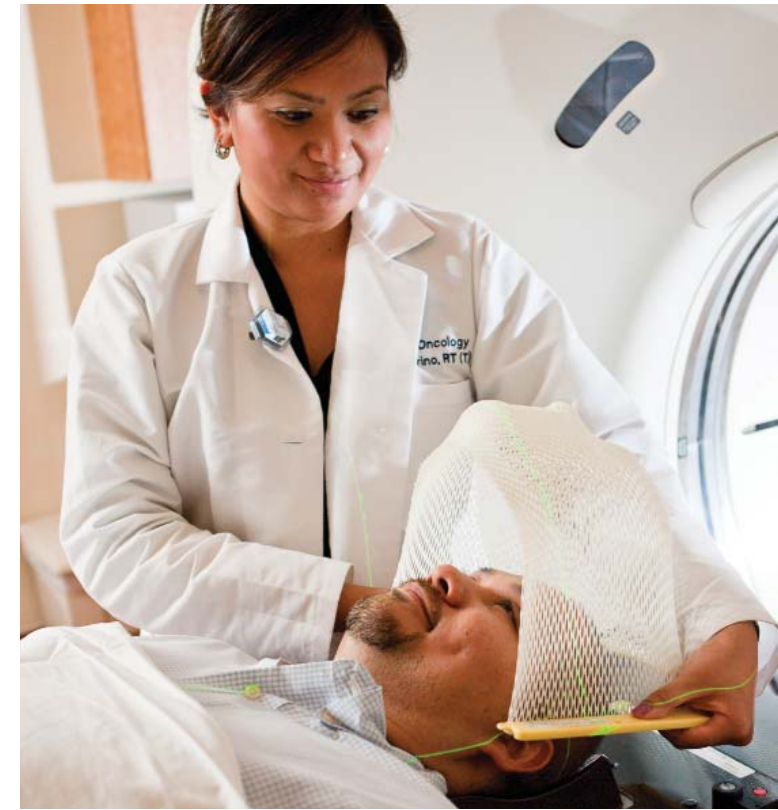
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**CARING FOR YOURSELF
NOTES/QUESTIONS FOR YOUR DOCTOR**

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**RADIATION THERAPY for
BRAIN TUMORS**

Facts to Help Patients Make an Informed Decision



ASTRO
TARGETING CANCER CARE
AMERICAN SOCIETY FOR RADIATION ONCOLOGY

ABOUT BRAIN TUMORS

The brain is the center of thought, memory, emotion, speech, sensation and motor function. The spinal cord and special nerves in the head called cranial nerves carry and receive messages between the brain and the rest of the body.

- There are two general types of brain tumors:
 - **Primary** - a tumor that starts in the brain. Primary brain tumors can be benign (not cancerous) or malignant (cancerous). Primary tumors in the brain or spinal cord rarely spread to distant organs.
 - **Metastatic** - a tumor caused by cancer elsewhere in the body that spreads to the brain. Metastatic brain tumors are always cancerous. Brain tumors cause damage because, as they grow, they can interfere with surrounding cells that serve vital roles in our everyday life.

This brochure is designed to address primary brain tumors. For information about radiation treatment for metastatic brain tumors ask your nurse or doctor for the brochure *Radiation Therapy for Brain Metastases*.

FACTS ABOUT BRAIN TUMORS

- The Central Brain Tumor Registry of the United States estimates that more than 612,000 persons are living with a diagnosis of primary brain and central nervous system tumors in the United States.
- An estimated 66,290 new cases of primary benign and malignant brain and central nervous system tumors are expected to be diagnosed in the United States in 2012.



TREATING BRAIN TUMORS

If doctors determine that you have a brain tumor, the treatment options and prognosis are based on the many factors, including tumor type, location and size of the tumor, how aggressive it appears (grade), as well as your age and health. Depending upon these and other factors, surgery, radiation therapy and medical therapy are possible treatment options.

Radiation Therapy

Radiation therapy, sometimes called **radiotherapy**, is the careful use of high-energy X-rays to safely and effectively treat brain tumors. Radiation works noninvasively within tumor cells by damaging their ability to multiply. When these cells die, the body naturally eliminates them. Healthy cells near the tumor may be affected by radiation, but they are able to repair themselves in a way tumor cells cannot. Radiation therapy can be used after surgery, or in some cases when surgery isn't safely possible. Ask your radiation oncologist more about whether radiation will be helpful for your treatment.

Surgery

For many brain tumors, surgery is a curative part of treatment. A **neurosurgeon** will usually perform one surgical biopsy to determine what kind of tumor you have. Often, that is the definitive surgery. Surgery can be done to maximize tumor removal while minimizing nerve injury or effects on your normal functioning. Depending upon what tumor you have, surgery may be the only local treatment needed. However, often radiation is used after surgery to lessen the chances of recurrence or further tumor growth. Ask your surgeon more about the extent of surgery best for you.

Medical Therapy

Sometimes, a medication may be helpful instead of radiation or to make radiation work better.

Chemotherapy has the ability to destroy cancer cells by different methods.

Depending upon the kind of drug best suited for your kind of brain tumor, chemotherapy may be given as a pill daily or by an intravenous (IV) line on a set schedule. For more details about chemotherapy or newer medications, ask your medical oncologist what may be best for you.

EXTERNAL BEAM RADIATION THERAPY

External beam radiation therapy involves a series of out-patient treatments with a machine called a **linear accelerator**, or linac. The radiation beam is painless and treatment lasts only a few minutes. Treatments are given daily, Monday to Friday, usually over three to seven weeks.

Before beginning treatment, you will be scheduled for a planning session to map out the area your radiation oncologist wishes to treat. This procedure is called a **simulation**. Simulation involves lying on a table, usually with a form-fitting mask to make sure treatment can be delivered the same way each treatment. A **CT scan** is performed with that mask, and then your doctor will design individualized treatment, often with information from other CT scans and MRIs you have had. Marks are made on the mask, not your skin, to help the radiation therapist precisely position you for daily treatment.

Different techniques can be used to give radiation for brain tumors. **Three-dimensional conformal radiotherapy (3-D CRT)** combines multiple radiation treatment fields to deliver precise doses of radiation to the brain. Tailoring each of the radiation beams to the patient's tumor allows coverage of the diseased cells while keeping radiation away from nearby organs, such as the eyes.

Intensity modulated radiation therapy (IMRT) is a form of 3-D CRT that further modifies the intensity of the radiation within each of the radiation beams. **Stereotactic radiotherapy** can be used in some tumors to be even more precise. At most centers, X-rays (photons) are used for treatment. **Proton beams** different from X-rays, can give less radiation to normal tissue. All three more precise techniques can be used for tumors in particularly sensitive areas. Ask your radiation oncologist about which technique is best for treating your tumor.

INTERNAL RADIATION THERAPY

Internal radiation therapy, or **brachytherapy**, works by placing radioactive sources in, or just next to, a tumor. During brachytherapy, a tube or balloon called a catheter may be inserted into the brain. The radiation will then be carried to the tumor using this catheter. The radioactive source will then be left in place from several hours to several days to kill the tumor cells. In some cases, the radiation is permanently placed directly into the tumor or the area where the tumor was before surgery. This is less commonly used for treatment than external beam radiation therapy.

POSSIBLE SIDE EFFECTS

- Side effects from radiation can include fatigue, hair loss where you received radiation, scalp irritation and muffled hearing. These will usually resolve a month or so after treatment. However, your hair might not grow back exactly as it was before treatment.
- Radiation may also cause some short-term memory loss and difficulty thinking.
- Side effects are different for each patient. Medications may be prescribed to make you as comfortable as possible.
- If at any time during your treatment you feel discomfort, tell your doctor or nurse. They can prescribe medicine to help you feel better.

CARING FOR YOURSELF DURING TREATMENT

- Get plenty of rest during treatment, and don't be afraid to ask for help.
- Follow your doctor's orders. Ask if you are unsure about anything. There are no stupid questions.
- Tell your doctor about any medications or vitamins you are taking, to make sure they are safe to use during radiation therapy.
- Eat a balanced diet. If food tastes funny or if you're having trouble eating, tell your doctor, nurse or dietician. They might be able to help you change the way you eat.
- Treat the skin exposed to radiation with special care. Stay out of the sun, avoid hot or cold packs, only use lotions and ointments after checking with your doctor or nurse, and clean the area with warm water and mild shampoo or baby shampoo.
- Battling cancer is tough. Seek out help from support groups and friends.