**Possible Side Effects of Radiation Treatment for Brain Tumors**

The radiation used to destroy cancer cells can also hurt normal cells in the area that is radiated. Side effects from radiation treatment can vary, depending on the area of the body being treated. Side effects are caused by the cumulative effect of radiation on the cells. This means they develop over time and most patients do not experience any side effects until a few weeks into their treatment. Side effects may be unpleasant, but there are treatments to help deal with them. Most side effects are temporary, disappearing gradually after therapy is complete.

Most radiation oncologists see their patients at least once a week while the patient is receiving treatment. This visit with the healthcare team serves as an opportunity to ask questions, discuss any side effects, and make a plan to help manage the side effects. However, you can report concerning symptoms any time to your treatment team.

**Acute (Short Term) Side Effects**

The following list includes some of the most common side effects of radiation therapy for brain tumors. Remember that the treatment can affect each patient differently, and you may not experience these particular side effects. Talk with your radiation oncologist and health care team about what you can expect from your specific treatment.

- **Fatigue** is very common with radiation treatment and tends to begin a few weeks into therapy. Fatigue typically resolves slowly over the weeks and months following treatment.
- **Hair loss** may occur where you received radiation. Hair typically starts to regrow a month or so after treatment. However, your hair might not grow back exactly as it was before treatment and for some, the hair loss becomes permanent.
- **Muffled hearing**: Your hearing may become muffled during treatment. This typically resolves in 2-4 weeks after finishing treatment.
- **Skin irritation**: The skin in the treatment area may become red, irritated, dry, or sensitive. This may progress to look like a sunburn. Treat the skin gently to avoid further irritation, and bathe carefully, using only warm water and mild soap. Avoid perfumed or scented lotions or soaps, as these may cause further irritation. Avoid sun exposure, which can worsen the irritation.
- **Some short-term memory loss and difficulty thinking** can occur if you are treated with whole-brain radiation therapy.
- **Brain tissue swelling** can develop during treatment. You may get a headache or feel pressure in your head if this occurs. The health care team watches for signs of this problem and may prescribe medications to decrease swelling. Let the team know if you experience these symptoms.

Side effects of **radiosurgery** are usually related to sending high doses of radiation to particular areas of the skull. For instance, if you are treated for an acoustic neuroma (a tumor involving the nerve that controls hearing), you might lose some hearing. Treatment for trigeminal neuralgia can lead to tingling or numbness of the face. Talk to your care team about potential side effects; they will be able to tell you what you might expect in your case.

**Long-Term Side Effects**

The side effects discussed thus far tend to occur during treatment, up until a few months after treatment. Long-term effects can occur months to many years after cancer treatment and the risks vary depending on the areas included in the field of radiation and the radiation techniques that were used, as these continue to develop and improve.

Though the risk is low, you should be aware of these possible long-term effects:

- There is a low risk of developing a second cancer in or near the radiation field. These are called secondary cancers, and they develop as a result of the exposure of healthy tissue to radiation. Modern radiation techniques are designed to limit
this exposure, but it is not always possible to prevent all exposure and still achieve the desired outcomes.

- Radiation necrosis. Rarely, a mass of dead (necrotic) tissue forms at the site of the tumor. If this occurs, it usually develops months to years after radiation is given. Occasionally, surgery may be needed to remove the necrotic tissue.
- Damage to healthy brain tissue. Although rare, this side effect can cause headaches, seizures, or even death.
- Harm to the pituitary gland and other areas of the brain, which can affect hormone levels in the body, including thyroid and sex hormones. Damage to the pituitary gland can affect future fertility for women and cause sexuality concerns for men. These can usually be managed by taking synthetic hormones.
- Loss of some brain function can occur if large areas of the brain receive radiation. There may also be other symptoms that develop as a result of damage to healthy brain tissue. These symptoms are dependent on what the treated area of brain controls and how much radiation was given. These risks must be balanced against the risks of not using radiation and having less control of the tumor.

After treatment, talk with your oncology team about receiving a survivorship care plan, which can help you manage the transition to survivorship and learn about life after cancer. You can develop your own plan using the OncoLife Survivorship Care Plan tool.

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