Patient Guide: Radiotherapy for a Brain Tumour

Radiotherapy uses high-energy rays to destroy tumour cells while minimizing harm to normal cells. This guide provides detailed information about the different types of radiotherapy, potential side effects, and the process of planning and receiving treatment.

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Gliomas are a group of tumours of the central nervous system arising from the brain and their aggressiveness range from low to high grade.

Surgery is often the first treatment of choice.

Chemotherapy maybe given, either in an oral form or via the veins.

Types of Radiotherapy

- Standard external beam radiotherapy for a brain tumour
- Stereotactic radiotherapy (SRT)
- Proton beam therapy

Radiotherapy for a brain tumour can be administered in various ways, each with its own unique benefits and considerations.

Standard External Beam Radiotherapy

Standard external beam radiotherapy is given with x-ray, and typically given as a number of short, daily treatments in a radiotherapy department. The treatment schedule and duration depend on the type of tumour and its size.

Each appointment usually takes about 10 to 30 minutes, with the actual treatment lasting only a few minutes. The treatments range from 1 to 6 weeks, depending on patient and disease factors.

For low grade gliomas, post-operative radiotherapy is given based on a few risk factors.

- bigger tumours
- age > 40 years old
- tumour extending into the other hemisphere
- neurological deficits
- absence of oligodendroglial components

For high grade gliomas, radiotherapy is given with or without chemotherapy.

- standard treatment consists of oral chemotherapy (temozolamide) with 6 weeks of daily radiotherapy.
- for patients who cannot tolerate combined treatment, it could be radiotherapy alone.
- radiotherapy maybe shortened to about 3 weeks for older patients.

Stereotactic Radiosurgery or Radiotherapy (SRS or SRT)

SRT is a precise method of focusing external beam radiotherapy, reducing the risk of damage to nearby areas of the brain. It can be given in various ways, including short daily treatments, a few sessions of higher dose treatment, or a single higher dose treatment known as stereotactic radiosurgery (SRS).

SRS is commonly used to treat small to medium-sized brain tumors, arteriovenous malformations (AVMs), trigeminal neuralgia, and certain functional disorders of the brain. It can also be used for metastatic brain tumors and other conditions where conventional surgery might be too risky or not feasible.

SRS is able to ablate/eradicate small metastases, or other brain tumours like acoustic neuromas, pituitary adenomas etc.

Control rates are high with SRS as very high doses are given in a few fractions (1 to 5). There are possible side effects including pseudoprogression or necrosis, in which there is swelling of the surrounding brain.

Proton Beam Therapy

Proton beam therapy uses protons instead of high-dose x-rays and is recommended for some rare types of brain tumours. It is given using specialized equipment that may not be available in all hospitals.

Common conditions that are suitable include:

- low grade gliomas
- grade 3 gliomas
- childhood brain tumours e.g medublastoma, germ cell tumour, ependymomas



Planning Your Treatment

Before undergoing radiotherapy, patients have a brain CT or MRI scan, or both to plan the treatment (simulation). The scan provides essential information for the radiotherapy team to carefully plan the treatment.

During Brain Radiotherapy:

During each radiotherapy session, you will lie comfortably on the treatment table, and the radiation therapist will carefully position you to ensure accurate delivery of the radiation beams. The treatment itself is painless and usually lasts only a few minutes.



Masks and Head frames

During radiotherapy, patients may need to wear a light-weight mask that covers the face and the front of the head to ensure accurate treatment. Some types of SRT, including SRS, require a light-weight metal head frame.

Having Radiotherapy to the Brain

During the treatment, patients lie in the same position as during the planning scan. The radiotherapists ensure comfort and provide the necessary support throughout the treatment. Each treatment lasts for about 15–30 minutes.



Side Effects of Radiotherapy

Side Effects of Brain Radiotherapy:

While brain radiotherapy is generally well-tolerated, you may experience some side effects, including fatigue, hair loss, skin irritation, headaches, and nausea. Your healthcare team will provide you with strategies to manage these side effects and improve your comfort during treatment.

Patients may experience side effects during or after treatment, which can depend on the area of the brain treated and the amount of radiotherapy given. It's important to communicate any side effects to the radiotherapy team for proper management.

Common side effects during the treatment include

- nausea
- hair fall (usually not complete, and only at where the radiotherapy beams enter)
- mild headache
- mild fatigue

These will resolve shortly after treatment. Your doctors will provide you medications.

Caring for Yourself During Treatment:

- Get plenty of rest and allow your body time to recover.
- Eat a balanced diet to maintain your strength and energy levels.
- Stay hydrated by drinking plenty of fluids.
- Engage in light exercise if possible, as it can help improve your mood and energy levels.
- Reach out to your support network for emotional and practical support throughout your treatment journey.

Late Effects of Brain Radiotherapy

Radiotherapy may cause side effects that develop months or years after treatment. These late effects are discussed with the doctor before treatment starts, and regular check-ups are recommended to monitor any potential late effects.

These may include

- hormone insufficiency if your treatment is near the pituitary gland
- radiation changes like inflammation (radiation necrosis 5% risk)
- vascular malformations (<5%)
- secondary cancers (rare)



Support groups

Singapore Cancer Society (SCS): SCS is a non-profit organization that offers support services to cancer patients across Singapore. While they may not have specific support groups for brain tumor patients, they provide counseling services, financial assistance, and other resources to help cancer patients navigate their journey.



Brain Tumour Survivor Support: BTSS is a patient-led organization dedicated to providing support and resources to individuals affected by brain tumors in Singapore. They organize support group meetings, educational seminars, and social events for patients and their families.